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Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Stories of the Week
Requiescat In Pacem
Lucky Grandchildren
No Money?

Stories of the Week

Without a hitch this trained seal lighted a big cigar, blew smoke rings which spelled out "M-O-T-H-E-R," and finished the act with a rousing "Star Spangled Banner" tooted on a bugle while waving an American Flag.

"Na-ah, can't use it," rejected the TV agent.

"Variety acts are no good unless you got pretty legs."

Chrysler Corp.
Airtemp Div.
Dayton, Ohio

Editor:

I happened to read the following in a copy of a talk given by a college professor recently. Thought you might be interested in it for your "Inside Dope" column.

"Is that an F-106?" asked a boy.

"No," replied another, "can't you tell that's an F-106A?"

"How do you know that?"

"Well, an F-106 has wings swept back at a 48° angle, and that plane has the wings swept back at a 52° angle."

"Supersonic, I suppose."

"More than that—it's superthermonic."

At that moment the schoolbell interrupted their conversation, and the first child scientist looked at the other disgustedly:

"Come on, Joe. We'll have to go back into school and string those darn beads again."

PAUL M. AUGENSTEIN,
President

Requiescat In Pacem

A superbed which does everything from soothing jangled nerves to taking dictation has been unveiled in New York. This Rolls-Royce of the bedroom is made by Slumberland Ltd. of England.

It is designed, possibly, with the 30-hour-week in mind.

"Most people spend one third of their lives in bed," it is promoted. "So why not be warm, comfortable, and relaxed?"

To those who buy this pregnant idea, Superbed provides twin three-foot mattresses which can be raised and adjusted to any position by the touch of a

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Inland Empire Model Code Covers Heating, Cooling, Ventilating

RIVERSIDE, Calif.—A model code covering heating, ventilating, air conditioning, refrigeration, and water conservation has been published recently by the Inland Empire Code Association, Inc. and made available for local adoption.

Primary objective of the code is to provide for safe installation of equipment and to regulate "to a reasonable degree" the quality of materials used in such installations.

J. Clifton Spradley, executive secretary of the Inland Air Conditioning and Refrigeration Contractors Association, Inc. and publisher of the code, declared that it will be put into effect "in the majority of the areas of Riverside and San Bernardino counties and other locations within the state in the very near future."

The Inland Empire Code Association was formed for the specific purpose of drafting this code. Membership includes building officials and inspectors of local communities plus persons and organizations in the industries involved interested in the purpose of the association.

These purposes also include promoting the adoption of the code, promoting uniform legislation and regulations affecting these types of equipment, and investigating and discussing the principles underlying safety in the installation and mainte-

(Concluded on Page 39, Col. 3)

Detroit Free Press Business Writer Plugs Home Cooling

DETROIT—A glowing testimonial for residential air conditioning was offered to Detroiters recently by John Woerpel, business writer for the *Detroit Free Press.*

Woerpel reported on his two years' experience in a new home cooled by a two-ton water-cooled unit with cooling tower. The unit is built into the fur-

(Concluded on Page 39, Col. 1)

Trend To Higher Voltages May Cause Industry Trouble

By C. Dale Mericle

DETROIT—Trend of electric utilities toward higher voltages is beginning to present problems for the air conditioning and refrigeration industry, particularly manufacturers of hermetic compressors.

Many in the industry, however, are woefully unaware of this trend or the problems that may result from it, complains one utility engineer, though perhaps not to accurately.

Thus far, the trend has been mostly confined to discussion, but some utilities have been quietly upping voltages instead of waiting for a nationally agreed upon move.

Underlying reason for the higher voltage trend is almost entirely economics. Delivering power would be cheaper that way. But by the same token, it's economics that could cause problems for the industry. Hermetic units could be more expensive, especially if voltages are increased in a hodge-podge manner.

Basically, the problem is this. Rapidly increasing use of electricity combined with rapidly increasing population has meant sharply rising demands on utilities for power supplies. While the cost of more power generating equipment cannot be ignored, the cost of distributing that power is a major factor. By increasing voltage, more power can be supplied through existing lines to the consumer.

Also, by using higher voltages, the consumer can reduce his wiring costs in many instances.

(Actually, the above basic explanations may over-simplify the problem, for such questions as single vs. three-phase and cycles are ignored.)

Eventually, or so it would seem, the conventional 120/240-volt system for residences

(Concluded on Page 10, Col. 1)

R. F. Lauer Joins Westinghouse Cooling Div.

STAUNTON, Va.—Rodney F. Lauer has joined Westinghouse Air Conditioning Div. here, as manager of engineering, effective July 15, it was announced by R. K. Serfass, division manager. He succeeds T. L. Rundlett, who has been appointed to the division manager's staff.

R. F. Lauer

After graduating from Cornell in 1930, Lauer embarked upon a course of student training in the air conditioning industry with York Corp. At the conclusion of that program, he was attached to the air conditioning division at York's headquarters for a period of approximately one year, following which he engaged in sales as-

(Concluded on Page 39, Col. 1)

As Strike Starts

Industry, Steel Warehouses Well Stocked

DETROIT — While keeping a watchful eye on developments in the nationwide steel strike, producers in the air conditioning, heating, and refrigeration industries do not expect to feel any immediate effects.

Long ago they took precautions to build up their inventories to 60 and 90-day levels. Vacation closings will help many conserve their steel supplies during the remainder of July and August.

At the same time, the American Steel Warehouse Association, Inc. reported that inventories of industrial steel products in steel service centers are at a record 3,700,000-ton level, 1 million tons more than at the start of the 1956 steel strike.

"Our industry will be able to take care of the normal steel service center requirements of large and small steel consumers alike for approximately 60 days before anything other than spot shortages occur, assuming that the present high rate of business activity continues," stated Robert G. Welch, Cleveland, executive vice president of the association.

COOLING OFF: Kozlov's Jet, Opium Den, and Sleepers

The huge Russian jet airliner TU-114 that ferried Deputy Premier Frol Kozlov between the USSR and USA was a superduper hit when on display at Idlewild Airport in New York City. Except for one thing.

New York's heat wave drove temperatures inside the 170-passenger craft to 132° F. With the Russians and visitors gasping for air and help, Pan American Airways came to the rescue. A 22-ton air conditioner lowered temperatures to a comfortable 70° F. for visitors inspecting the plane.

* * *

Here's a man with a truly portable air conditioner and he is not happy. He put the following classified advertisement in the Washington *Post* recently:

"AIR CONDITIONER—Want to exchange 1958 ¾ 7½-ounce casement for sash." (Thanks to George J. Webster, Kensington, Md.)

* * *

Police in Bangkok, Thailand recently captured an air conditioned opium den—on wheels. Finding four Chinese smokers lounging in easy chairs in the rear of a small British van, they got this explanation from the truck's owner:

"I cater only to high class addicts."

* * *

When trouble developed in the turbine charger with the 1,250 kw. generator at the Newton, Ill. lighting plant, commercial and residential air conditioning owners heroically and voluntarily turned their units off so that the town's old small capacity generators could provide for more essential services.

Usually, Mayor Emmerich could call on the services of a portable generator owned by a nearby utility. But, wouldn't you know it, the portable was down for repairs, too.

* * *

A Golden, Colo. mountain hotel advertises 30 air conditioned rooms with the note: "If you can't sleep here, it is your conscience."

Fedders Fiscal Third Quarter Earnings Rise Above 1958 To Continue Trend

MASPETH, N. Y. — Continuing a trend that has persisted throughout the current fiscal year, third-quarter earnings of the Fedders Corp. again were above those for the comparable 1958 period. Net income, after taxes, for the nine months ended May 31, 1959 was 27% above that of a year earlier, Salvatore Giordano, chairman and president, said in his recent report to stockholders.

The gain in earnings, Giordano reported, "was achieved despite a 2.5% decline in overall sales caused entirely by the elimination of our contract air conditioner business by the expiration of our agreement with a customer at the close of June, 1958.

"Although sales of all major Fedders product groups have increased as against a year ago," Giordano said, "the rise in volume on our own brand air conditioners has been the principal factor responsible for the higher earnings.

"The company's year-round air conditioners, which feature the Fedders heat pump, continue to find increased consumer acceptance. This is particularly true of the central systems, which builders are using for both heating and cooling homes, as well as the "Four Seasons" room units which are finding a commercial market in motels, hotels, and other similar establishments.

"In addition, both unit and dollar sales of Fedders room air conditioners reached new record highs and, on the basis of available information, management is of the opinion that the Fedders brand has continued to hold its position in this field and that the company has further increased its share-of-market."

For the nine months ended May 31, net sales of the company were $38,342,688 as compared with $39,321,559 a year earlier. Profit before taxes was $4,267,568 as against a pre-tax profit of $3,328,903 for the corresponsing period of fiscal 1958.

Net income, after taxes, totaled $1,940,963 and was equivalent to $1.00 per share on the 1,906,128 shares of common stock currently outstanding after provision for preferred dividends. This compares with a fiscal 1958 nine months net income of $1,528,703, or 78 cents per common share, calculated on the same basis.

Sales for the fiscal 1959 third quarter amounted to $15,028,569 as against $14,733,038 for the same months of a year ago. Profit before taxes was $2,003,752 as compared with a fiscal 1958 third-quarter pre-tax profit of $1,676,299.

Net income, after taxes, was $914,647, or 46 cents per common share on the currently outstanding stock, after preferred dividends, as against net earnings of $761,399 for the same months of fiscal 1958, or 40 cents per share, calculated on the same basis.

"Sales of all the company's major product groups," Giordano said, "are currently continuing at satisfactory levels. Consequently, year-end earnings should be above those for fiscal 1958."

Controls Co. of America Considering Public Offering of Common Stock

SCHILLER PARK, Ill.—Controls Co. of America recently filed a registration statement with the Securities & Exchange Commission covering a proposed public offering of 191,703 shares of the company's $5 par value common stock.

It is anticipated that the offering will be made after the proposed 50% common stock distribution to be considered by stockholders of the company at a meeting which has been called for July 21.

Of the total offering, 50,000 shares will be sold by the company and 141,703 shares by a group of selling stockholders.

Proceeds from the sale of the 50,000 shares will be added to company general funds, with approximately $750,000 earmarked for ultimate use in the acquisition of a Canadian plant for the production of fractional horsepower motors and laminated solenoids, construction of an addition to an electrical components plant at Folcroft, Pa., and acquisition of property and equipment in Arizona for production of silicon rectifiers and other semi-conductor products.

Approximately $170,000 will be used to retire mortgage notes, and $250,000 will be allocated to investment in and advances to Controls A.G., a Swiss subsidiary, to finance proposed manufacturing operations abroad, principally in South America.

The remainder of the company's proceeds will go into working capital.

NEWHACA Advises:

Add 3-5 Points to Discomfort Index For Indoor Use

CLEVELAND — To make practical use of the U. S. Weather Bureau's Discomfort Index—or Temperature-Humidity Index—a person should add from three to five points of discomfort for indoor conditions.

So advises Herbert T. Gilkey, technical director of the National Warm Air Heating & Air Conditioning Association.

Unless the indoors is air conditioned, he said, lack of air motion will cause discomfort for those inside, while persons outside will be comfortable.

Indoors, he pointed out, the film next to the skin makes people feel as though they are living in a stagnant pool, literally bathed in their own perspiration. Outdoors, air motion removes this perspiration and gives relief.

Gilkey commended the Weather Bureau for issuing the new discomfort index.

"Daily announcement of the discomfort index has made more Americans aware of the comfort problem and what can be done than any other happening in 50 years," he declared.

REPRINTS
SELLING FOR PROFIT.
By Frank Klein—Only $1.00 ea. Clip this ad and mail with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

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Acme COOLING TOWERS

AND OTHER WATER-SAVING EQUIPMENT

Choose Acme and get exactly the condensing equipment you need for efficient economical operation. The new Acme outdoor cooling tower shown at the right, for instance, completes the Acme line of water-saving equipment with a tower that is smaller, lighter and more efficient than any other on the market today. Think of the saving in supporting structure costs, in erection costs, in maintenance. And the new Acme outdoor cooling tower can easily be disassembled and reassembled in the field for easier, lower cost erection on rooftops and in other inaccessible places.

Every piece of Acme condensing equipment, like all products in the new Acme line, is built to give you more capacity in less space . . . more value for your air conditioning dollar.

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Acme offers a wide choice of equipment from which to build a complete system exactly suited to your needs. You can get either wet or direct expansion cooling with a wide choice of air handling equipment and water-saving condensing equipment. Get the full story on the equipment you need from your nearby Acme sales engineer or write directly to the factory.

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JACKSON, MICHIGAN

Manufacturers of quality air-conditioning and refrigeration equipment since 1919

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Packaged Water Chillers
1¼ to 60 tons with hermetic compressor. 20 to 125 tons with direct drive compressor.

Air Handling Equipment
665 to 36,000 cfm capacity in single and multi-zone models. Complete group of accessories.

Remote Room Conditioners
200 to 600 cfm capacity in horizontal and vertical models with and without cabinets.

Packaged Air Conditioners
3 to 60 tons capacity, air or water cooled. Heating coils and full line of accessories.

Sales of Oil-Fired Residential Heating Equipment Showing Marked Increase

NEW YORK CITY—Sales of oil-fired central heating equipment for residential use are showing a marked increase, the Oil Heat Institute of America's research department reports.

A sharp increase in manufacturer shipments of oil heating units in May brought the total shipments for the first five months of 1959 to 185,622 units, a 10% increase over the same period in 1958.

Biggest jump percentagewise occurred in boiler-burner units. OHI reports that shipments in May amounted to 3,457, a 31% increase over May 1958. Total boiler-burner shipments for the first five months were 16,825, 20% more than last year.

Oil heat also showed a sales increase in warm air furnace-burner units. The OHI reports 23,415 units shipped, representing a 7% increase over the previous May and, for the first five months, up 4% over the same 1958 period.

Shipments of oil burners sold separately for replacement, conversion to oil from other fuels, and for field assembly totaled 16,150 for May, the figure topping May 1958 by 22%. Burner shipments of 64,207 from January through May 1959 represent an increase of 18% over 1958.

Data on G-E Thermostats

SCHENECTADY, N. Y.—Complete information on all General Electric room thermostats for heating and cooling applications are described in bulletin GED-3585A.

Wile, Adachi Get Room Unit Patent

LOS ANGELES—The U. S. Patent Office has awarded Dan Wile, vice president and chief engineer, and Zhizuo Robert Adachi, chief engineer for refrigeration products, of Recold Corp. a patent covering the Recold "RE" unit room air conditioner, it was announced by H. T. (Hy) Jarvis, president of the corporation.

The unit is designed for individual room installations in hotels and motels.

"The off-center location of the fan uses the cabinet in the same manner of a scroll on a centrifugal blower," it was pointed out. "This positioning creates smooth even air flow and combined with a revolutionary fan design, quiet motor, and low air velocities completely eliminates noise in the RE unit."

Many New Exhibitors Sign Up for Space At ARI Exposition In Atlantic City

WASHINGTON, D. C.—Many exhibitors who have never before shown in an ARI Show are signing contracts for space in the 11th Exposition of the Air Conditioning and Refrigeration Industry to be held at Atlantic City, N. J., Nov. 2-5, reports R. H. Luscombe, chairman of the 11th ARI Exposition Committee.

The new applications are coming in as the result of recent mailings outlining the scope of the show and the "conference sessions" which are being set up by ARI as a special attraction for this year's exposition, Luscombe said.

As a result, available space is about 71% contracted for by the 165 exhibitors now signed up four months before show time. A number of special exhibits are being planned by Federal agencies.

The Departments of Defense and Agriculture, among others, have indicated an interest in placing exhibits at the Exposition, showing the many essential applications of refrigeration and air conditioning to the nation's defense and present-day food supply.

At the same time speakers are being lined up to participate in the conference sessions, a newly developed phase of ARI Expositions.

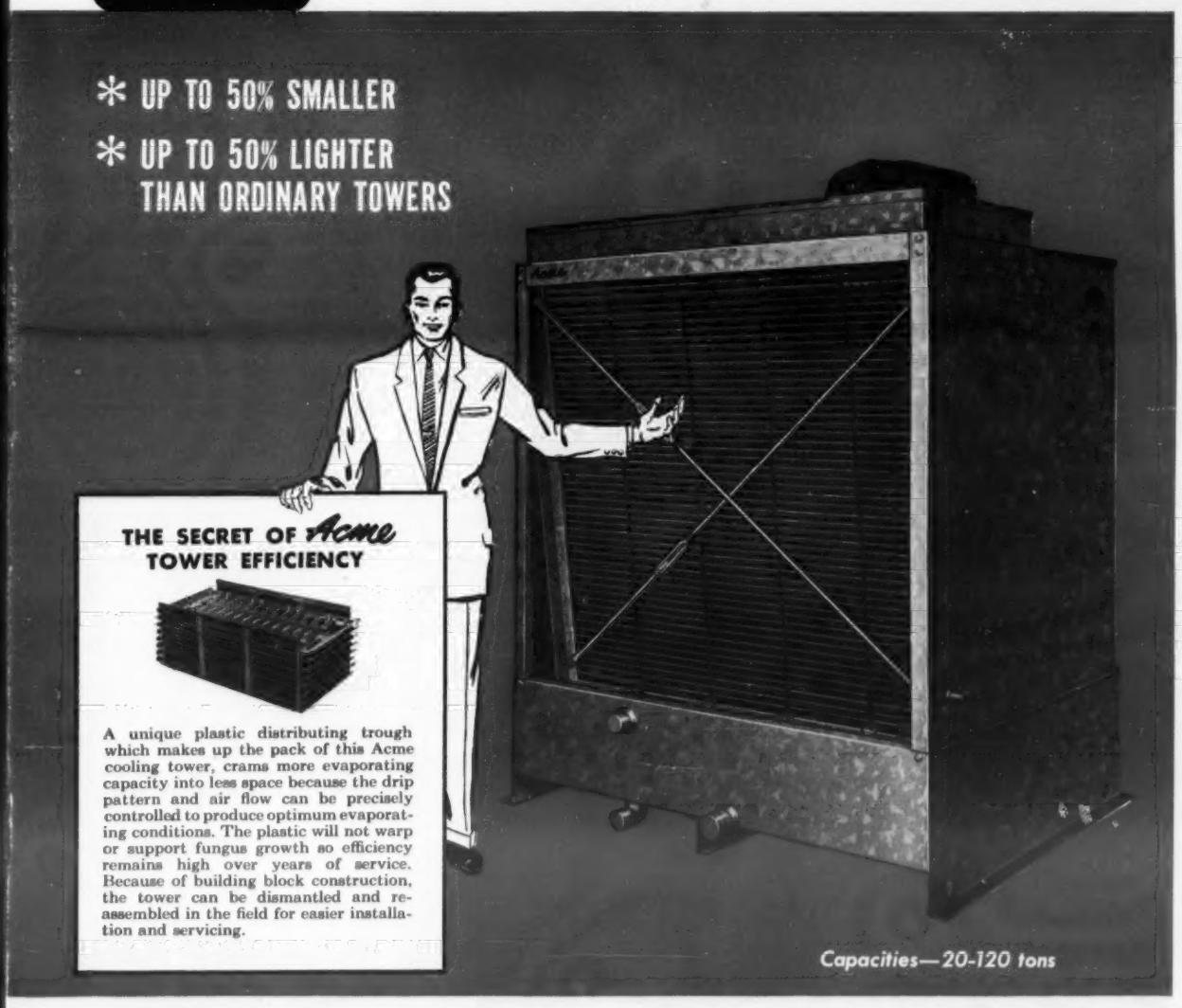
Names of speakers, as well as the outline for the presentations, will be announced as soon as the program has been firmed up.

Special promotional mailings are being made to a selected group of 5,000 architects and consulting engineers whose day-to-day work involves the planning and specifying of air conditioning and refrigeration equipment in hundreds of new and existing buildings, including homes.

"We believe that the interest of the new companies who have never shown before, plus the conference sessions which have never been a part of ARI Shows, will make our 11th Exposition one of the most outstanding that the industry has seen," reports George E. Mills, show director.

Acme ...the **practical** approach to air conditioning

* UP TO 50% SMALLER
* UP TO 50% LIGHTER THAN ORDINARY TOWERS



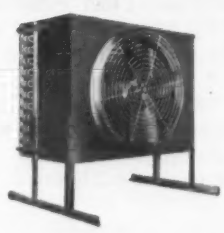
THE SECRET OF Acme TOWER EFFICIENCY

A unique plastic distributing trough which makes up the pack of this Acme cooling tower, crams more evaporating capacity into less space because the drip pattern and air flow can be precisely controlled to produce optimum evaporating conditions. The plastic will not warp or support fungus growth so efficiency remains high over years of service. Because of building block construction, the tower can be dismantled and reassembled in the field for easier installation and servicing.

Capacities—20-120 tons

Small Cooling Towers
3 to 20 tons capacity for either indoor or outdoor use. Plastic pack means permanently high efficiency combined with minimum weight and space.

Large Cooling Towers
20 to 175 tons capacity for indoor or outdoor use. Centrifugal fans for maximum air movement. Plastic deck for light weight and high efficiency.



Air Cooled Condensers
3 to 100 tons capacity. No water required. Turbaire fin design increases heat transfer efficiency as much as 15% to give more capacity with less size.

Evaporative Condensers
Up to 200 tons capacity. Staggered tube coils improve air circulation and turbulence, provide maximum evaporation rate in minimum space.

Wolverine Tube's Diamond Key Award Goes to Hendrickson

DETROIT — Annual Wolverine Tube Diamond Key Award was presented this year to Prof. H. M. Hendrickson, author of the outstanding technical paper related to refrigeration, published in *Refrigerating Engineering*. The announcement was made by John M. Dumser, director of sales for Wolverine Tube, Division of Calumet & Hecla, Inc.

Hendrickson is a professor in the department of mechanical engineering, University of Washington in Seattle. His prize winning paper is entitled, "Saline Water Conversion by Freezing."

The award presentation was made by the American Society of Heating, Refrigerating & Air-Conditioning Engineers at its annual meeting held in Lake Placid, N. Y.

Nemes Joins Meier as General Sales Manager

INDIANAPOLIS — Ted Nemes, nationally known appliance industry sales executive, has joined Meier Electric here as general sales manager.

Milton Keiner, president, said Nemes would direct and coordinate the sales of all Meier electrical products including the rapidly expanding electric heating equipment for homes.

Prior to joining Meier Electric, Nemes held executive positions with Cory Corp., Admiral Corp., and Fedders Corp.

Arizona Contractors Face Union Charge Of Unfair Bargaining

PHOENIX, Ariz.—A charge, accusing the Air Conditioning Contractors of Arizona and members-contractors with unfair bargaining practices, has been submitted by the Sheet Metal Workers Local 359 to the NLRB office here for filing.

The association, whose members are principal employers of Local 359 in Maricopa and eight other Arizona counties, has been accused of forcing former association members to lock out members of Local 359.

Local 359 recently struck the association, thus causing a bogdown in house construction.

Anderson Ward, attorney for the union, said the lockout . . . and in some cases, attempted lockout . . . is against five local employers who have elected to come to terms with the union. Four of them, he stated, quit the association, and the fifth never was a member.

The five firms are Copeland Sheet Metal, Brown & Sons, Phoenix Air Conditioning, White Way Refrigeration Service, and Pioneer Heating & Cooling.

As a result of threats made upon them, Ward declared, three of the companies have already locked out Local 359 members despite the union's having come to terms.

Ward said the association seeks to force the companies to submit to the association as collective bargaining agent.

For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.
Only 25¢ each.

McCall's Reader Panel Shows High Interest In Home Air Conditioning

NEW YORK CITY—A survey conducted among approximately 1,400 subscribers to *McCall's* magazine found one out of four interviewees had some kind of air conditioning in their homes.

Of the owners, 23.3% had central air conditioning and 76.7% had one or more room units: 46.3% thought of air conditioning as essential.

The survey found that 78.6% of central system owners feel that air conditioning enhances the value of the home.

In building or buying a new home, 15.8% of non-owners would insist on central air conditioning, 46.8% of room unit owners would so insist, and 71.2% of central system owners would want it again.

More than half of those surveyed thought of a portable air conditioner as one that can be readily moved from room to room.

The survey found all respondents were interested in smaller and more compact air conditioners.

Most non-owners said they would install their first unit in a bedroom.

Hermetically Sealed Unit Blast Injures Shop Man

LOS ANGELES — Ted Murzyn, appliance repair shop operator here, suffered compound fractures of the skull when a hermetically sealed refrigeration unit he was working on exploded, according to a report in the Los Angeles *Times*.

Cincinnati Buys 40 Air Conditioned Buses for Next Year

CINCINNATI — Cincinnati Transit Co. has purchased 40 air conditioned buses from General Motors Corp. for use next year.

These will be the first air conditioned coaches in Cincinnati and will be the forerunner of a completely air conditioned fleet, according to Lloyd I. Miller, chairman of the transit firm.

Miller said the buses go into production this October and will begin arriving in Cincinnati on March 1. They will be put into immediate service. Cincinnati will be the first city to have them, he added.

Air ducts are built into the body and will circulate 3,000 c.f.m. of cooled or heated air. Arrangement of ducts are designed to overcome air losses from opening and closing doors. Air conditioning condenser is built into the roof at the rear.

Air conditioning will account for $4,500 of the $31,600 cost per bus.

NWAHACA To Meet In St. Louis Nov. 30

CLEVELAND — National Warm Air Heating & Air Conditioning Association will hold its 46th annual convention at the Chase and Park Plaza hotels in St. Louis Nov. 30-Dec. 4.

Committee meetings are slated for Monday and Tuesday, Nov. 30 and Dec. 1, while convention sessions start Wednesday and run through Friday, according to George Boeddener, managing director.

Weather Calendar Forecasts for Month

NEW YORK CITY—A promotional weather calendar service, a monthly forecast by accredited meteorologists, is being offered to advertisers by Weather Trends, Inc., a weather consulting firm specializing in long range forecasts.

The calendar, with each day marked by a color code to indicate the predicted weather, takes up most of one side of a card approximately 3 by 6½ in. Remainder of that side and reverse is occupied by advertiser's message.

Norris Heads Atlanta Mech. Contractors

ATLANTA—Mechanical Contractors Association of Atlanta, Inc. recently elected Millard C. Norris its president. Norris is president of Norris & Co.

Other officers of the association are: Ralph C. Dodson, vice president; R. T. Lloyd, secretary; and E. R. Hillard, treasurer. J. W. Edgar was elected to the board of directors.

Vilter Names Muth

MILWAUKEE — Charles R. Muth, formerly with Mueller Climatrol, division of Worthington Corp., has been appointed advertising manager of Vilter Mfg. Co., it was reported.

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Alco Designed
CONTOUR POWER ASSEMBLY
Increases power element life as much as 10 times over other designs by reducing extreme flexing of the diaphragm. Standard construction on all ALCO "T" Series and "HTL" Series.
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American-Standard Names District Mgr., 4 Representatives

NEW YORK CITY—Appointments of a district manager and four sales representatives have been announced by American-Standard Air Conditioning Div.

William Gaskell has been named central district manager. He will be in charge of the division sales activities in an area from Michigan to eastern Tennessee including upper New York State, and the western half of Pennsylvania. He joined the division early in 1958 as Boston district representative.

New sales representatives are John Slein, district representative in the New England area; Jan Winter, sales representative in the midwest district; Bill Gregory, district representative in the Wisconsin-Illinois territory; and Joel Leeson, district representative covering northern New Jersey, and Westchester County and Long Island in New York State.

Surface Combustion Announces Deferred Payments for Hospitals

TOLEDO — Surface Combustion Corp., maker of temperature and humidity control equipment claimed able to eliminate 97% of airborne micro-organisms, has announced a deferred payment finance plan that will permit hospitals to acquire the units on three-year terms.

"Kathabar systems are being used in many hospitals and in hundreds of companies where temperature, humidity, and air hygiene are important in the production, testing, and storage of products, or just for the comfort of workers," said John E. Taylor, credit manager.

Financing programs for the Kathabar systems and other Surface products were developed with C.I.T. Corp. Under the company's financing program, Taylor pointed out, Kathabar systems can be installed with an initial payment of 25%, the remainder in 36 monthly payments.

Carrier Catalog Describes Sheet Metal Specialties

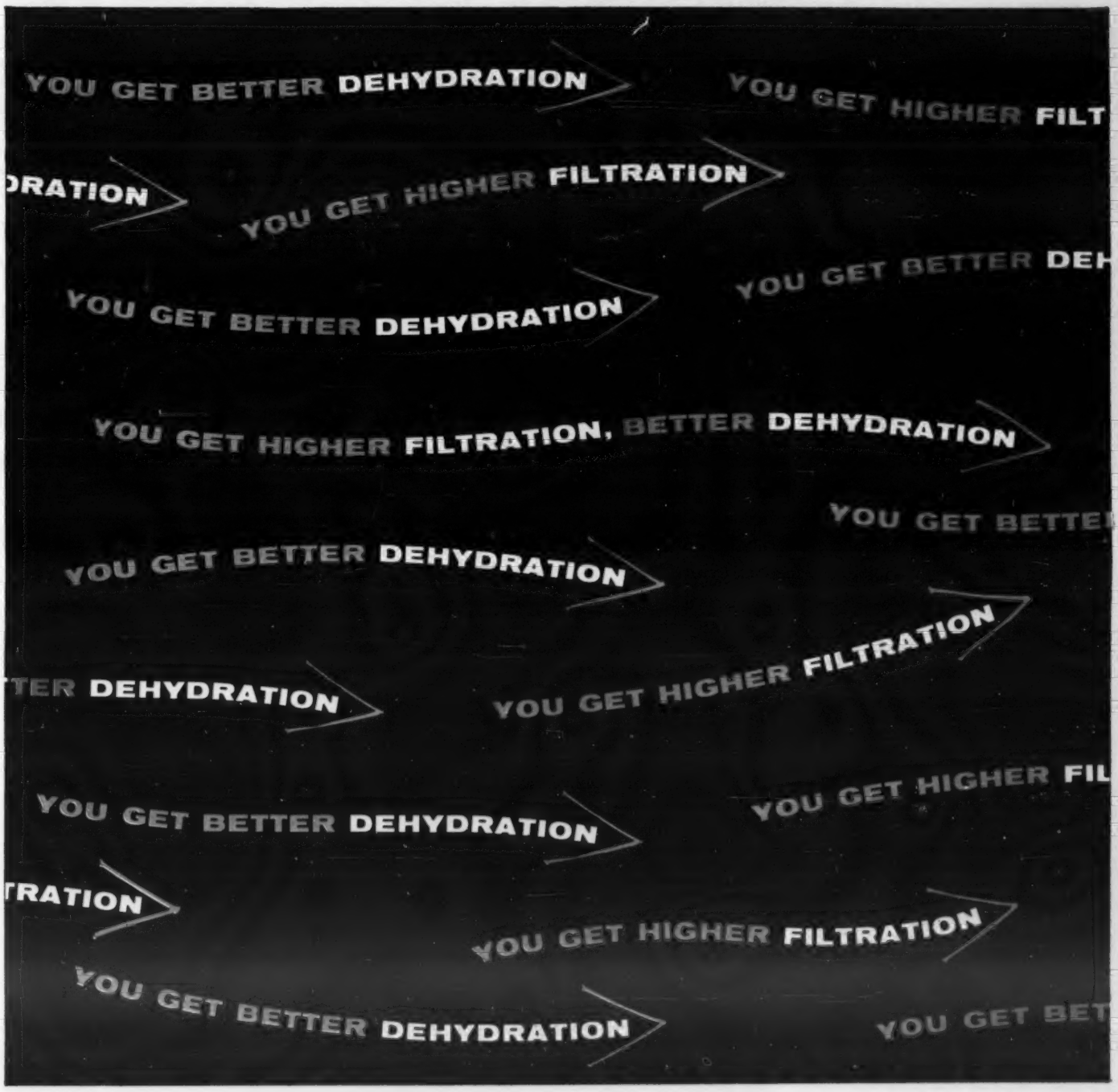
SYRACUSE, N. Y.—A comprehensive catalog of sheet metal specialties serving a wide variety of applications, is announced by Carrier Corp.

The 12-page brochure provides detailed information on round metal ducts called "Spira-Pipe," made only by Carrier in any diameter from 3 to 24 in. The pipe, developed for high-velocity, high-pressure air conditioning systems, can also be used for irrigation, grain handling, mine ventilation, exhaust lines, or casing for concrete pillars.

Catalog 35-8 also introduces two new products: (1) Die-formed elbows for 45 and 90° available in six sizes from 3 to 8 in. in diameter. (2) A line of flexible quick-connectors of 3 to 24 in. in diameter using flanged sleeves to form an air-tight fit.

Herman Nelson Equipment Goes to School

A COMPACT, highly-mobile, all-aluminum trailer is being used by the Herman Nelson Unit Ventilator Products Div., American Air Filter Co., for comparison showings of school heating, ventilating, and air conditioning equipment before school boards, architects, and consulting engineers in the eastern states. The sleek 16-ft. trailer contains the firm's latest classroom unit ventilators and/or air conditioning units, cabinets, and accessories. The unit, usually exhibited by Dave Johnson, New York City, AAF's eastern region field service engineer for Herman Nelson, and can be transported to any community in the eastern region in a few hours and can be set up and operating in a matter of minutes. The service to the architects, consulting engineers, and school board officials has caused much favorable comment for AAF. The attractive looking trailer also creates much attention when parked outside a school.


YOU GET BETTER DEHYDRATION
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with Davison PA-400

For full-flow filtration *plus* the low moisture content you require—specify Davison PA-400.

For filtration of very low micron-sized contaminants plus moisture reduction to less than 10 ppm in seconds—specify Davison PA-400.

For the same high no-bypass filtering efficiency achieved in the food industry with granular beds plus a desiccant that cannot soften, swell or disintegrate—specify Davison PA-400.

In fact, for the highest filtering efficiency plus the best drying action you can buy—*insist* on Davison PA-400 in your dehydrators. Write Dept. 2537 for full information and technical bulletin.

W.R. GRACE & CO.
DAVISON CHEMICAL DIVISION
BALTIMORE 3, MARYLAND

Deutsch Electrical Connector Plant Features Conditioning

LOS ANGELES — Air conditioning is a feature of The Deutsch Co.'s new electrical connector plant in Banning, Calif., which will be opened Sept. 4.

Finishing touches are now being made on the more than 35,000 sq. ft. of space to be used for a completely integrated production and engineering facility for Deutsch electrical connectors.

The building will house rubber and plastic molding equipment for connector inserts, a prototype shop, complete design and engineering facilities, a comprehensive certified testing lab, complete assembly operation, and the main administration offices of the Electronic Components Div.

Metallurgical Lab To Have Conditioning

SYRACUSE, N. Y.—A new metallurgical laboratory nearing completion at Allegheny Ludlum Steel Corp.'s Brackenridge, Pa. research center will use a hermetic centrifugal refrigeration machine as the cooling source for air conditioning, according to Charles V. Fenn, Carrier vice president.

The two-story structure will provide 62,000 sq. ft. of additional research facilities when completed later this year.

The Carrier centrifugal, with a cooling capacity of 338 tons, will be located in a separate powerhouse. The electrically-driven unit will supply chilled water at 42° F. through underground pipes to air handling equipment on the roof of the laboratory. A dual duct system will distribute air to the conditioned area.

IBM Awards Contract For Cooling Research Center In Yorktown

NEW YORK CITY—A contract for the installation of an air conditioning system with a refrigerating capacity of 2,500 tons in the International Business Machine Corp.'s Research Center, now under construction at Yorktown, N. Y., has been awarded to A. D. Walker & Co., Inc., who will undertake the work jointly with the J. E. Schecter Co., it was announced recently.

The contract, which also calls for the installation of the Research Center's heating and ventilating system, was awarded by the William L. Crow Construction Co., general contractor for the project.

Belmont Plant Cooling Costs $100,000

BELMONT, N. C. — Completion of a $400,000 modernization program at Belmont Throwing Corp. here was announced by Henry Lineberger, secretary-treasurer, who said $100,000 of the amount was spent to air condition the plant.

Therm-Air Conditions Laboratory

PEEKSKILL, N. Y.—Therm-Air Mfg. Co. here has designed and installed a new research and test laboratory. It will perform a double duty—basic research and development of special air conditioning units for government and industry.

The laboratory has been designed for complete automatic recording, but can also be operated by manual control.

A gas-fired boiler and electrical heaters, plus two packaged water chillers, supply the calorimeter room with conditioned ambient temperature and water. Each packaged chiller is equipped with hot gas by-pass and adjustable expansion valve which provides the chiller unloading.

Sample shop area for the fabrication of prototype units is also included in the facilities. One feature is the use of 6-in. cork insulated walk-in freezer boxes for the calorimeter rooms.

The laboratory was built primarily for the certification of capacity ratings of Therm-Air packaged air conditioners. This was done under the ARI certification program.

Here's Why Industry Is Air Conditioning

NEW YORK CITY — Where possible, industrial companies are air conditioning their plants to cut cleaning costs as well as to improve employe productivity. Air conditioned plants usually have fewer windows and this also cuts costs.

This was one of the key findings of a survey made by *Dun's Review and Modern Industry* to find out what industry is doing to reduce maintenance costs.

The business management magazine surveyed 171 maintenance executives of small to large-size companies throughout the U. S. on their cost-cutting techniques and management methods. The complete survey results appear in the article, "Getting the Most for Your Maintenance Dollars," in the July issue.

Cool Calorie Center

TOPTON, Pa. — A one-story research and development center to be constructed for Caloric Appliance at its plant here will be air conditioned and of masonry and curtain wall construction. Abraham Levy & Co. is architect for the project.

Develops Equipment For Making Strainers

DETROIT—C. W. Morris Co. here announced that it has developed new equipment for producing flat, wire cloth strainers with outer U-Bindings from standard die sets.

This process eliminates the usually high cost of special tooling, the company said in its announcement.

Specifications for the U-Bound strainers are: 4 in. to 10 in o.d. in ½-in. increments, 3/16-in. binding of .020-in. brass, aluminum, or monel. Screen from 20 to 100 mesh in any metal.

Donald L. Murphy Wins Station Wagon In Du Pont 'Partners for Profit' Contest

WILMINGTON, Del.—Donald L. Murphy, 24-year-old assistant office manager of Shepler Refrigeration, Inc., Portland, Ore., has been named winner of the grand prize of a 1959 air conditioned Chevrolet station wagon in a nationwide contest conducted by du Pont's "Freon" Products Div.

Murphy won out over nearly 11,000 other contestants in the three-month contest by submitting the best statement of why he likes to do business with a "complete refrigeration wholesaler."

The contest, designed to point up the many services provided by leading wholesalers of refrigeration equipment and supplies, was limited to customers of recognized wholesalers and was supervised by the Reuben H. Donnelley Co., Chicago direct mail merchandising firm.

Samuel G. Baker, general manager of the du Pont Co.'s Organic Chemicals Dept., presented the top prize to Murphy at a special ceremony July 6 in the showroom of Refrigerative Supply, Inc., Portland. Murphy submitted his prize-winning statement through that firm.

DONALD L. MURPHY (center), assistant office manager of Shepler Refrigeration, Inc., of Portland, accepts keys to 1959 air conditioned Chevrolet station wagon awarded him as grand prize winner in "Partners for Profit" contest conducted by du Pont's "Freon" Products Div. Presentation was made by Samuel G. Baker, general manager of du Pont's Organic Chemicals Dept. Looking on at right is W. J. Hieber, president of Refrigerative Supply, Inc., Portland firm through whom Murphy submitted his entry.

More than 275 other prizes, ranging from $1,000 U. S. savings bonds to portable transistor radios, will be awarded within the next few weeks to other winners in the du Pont "Partners for Profit" contest, highlight of the company's 1959 merchandising program to promote "Freon" refrigerants and the wholesalers who handle them.

Contents of the prize-winning statements will not be announced officially but will be used throughout the next year in the company's advertising and sales promotion program.

Second prize winners, each of whom will receive a $1,000 U. S. savings bond, are:

Bernard A. Wass, an air conditioning and refrigeration equipment inspector at Bethlehem Steep Corp., Johnstown, Pa. (Entry through Allen Supply Co., Altoona, Pa.)

James A. Harrington, owner of H & S Refrigeration Co., Dillon, Mont. (Entry through Temperature Supply Co., Billings, Mont.)

Howard L. Boggs, owner of A-C Refrigeration Co., Pueblo, Colo. (Entry through J. F. Dammann Supply Co., Pueblo.)

Third prize winners, each of whom will receive an RCA Victor "Mark 21" color television receiver, are:

Gerald W. Woolever, superintendent of refrigeration at Dow Chemical Co., Midland, Mich. (Entry through Saginaw Distributors, Inc., Saginaw, Mich.)

Miss Jeannette E. Viens, Allston, Mass., secretary to the chief engineer of The Bay State York Co., Brookline, Mass. (Entry through New England Refrigeration Supply Co., Boston.)

Dwight W. Bishop, Santa Fe Springs, Calif., office manager for Dacey-Plakos Corp., Downey, Calif. (Entry through Authorized Supply Corp., Los Angeles.)

Martin F. Kelly, owner of Kelly Refrigeration Service, Delaware, Ohio. (Entry through Mason Supply Co., Columbus.)

Thomas LeRoy Frierson, Jr., owner of Roy Frierson's, Deland, Fla. (Entry through R & R Supply Co., Inc., Daytona Beach, Fla.)

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

1959–15,000,000 horsepower
1965–26,000,000 horsepower

Conservative estimates place the total horsepower of all motors driving fans and blowers in the United States at about 15,000,000 horsepower. And in 1965 it is estimated that the total will be about 26,000,000 . . . an annual growth of 5% for the air moving industry. To make sure all this equipment gives top performance requires careful matching of motor to equipment . . . and a wide variety of different types of motors. Century Electric application engineers can help you select the right motor for your fans, blowers and allied equipment:

For fans—Two basic types of motors, CS and CP, meet most requirements for fans operating from single phase power. Both these Century Electric capacitor start motors provide high starting torque. Fans operating from polyphase power perform best with SC and SCM motors.

For blowers—If the starting load is light or if there will be short time increases in load, then the Century Electric Type SC polyphase motor is ideal. It will give you enough starting torque, and with low starting current. It comes in ⅙ to 400 hp sizes. If you need two, three or four different fixed speeds while the blower is running, the Century SCM polyphase motor will do the job.

For compressors—Where high starting torque is required to overcome great inertia or backpressure, the Century Electric Type SCH polyphase motor is right. This motor comes in sizes ranging from three to 400 hp and in dripproof, totally-enclosed and explosion-proof enclosures. It also provides the right kind of power to drive reciprocating pumps with high starting torque requirements.

For pumps—Centrifugal pumps, whose torque demands increase with speed, perform best with Century Electric SC polyphase motors. Reciprocating pumps with high starting torque requirements need the SCH. For all types of pumps, as well as for compressors and blowers, Century Electric makes single phase motors.

For special applications—Century Electric makes a variety of motors for specific operating conditions. The shaft-mounted fan motor is designed for unit heaters and evaporators. It comes in ⅓ to 3 hp sizes. Hermetic motors can be built right into a refrigeration compressor unit . . . they are manufactured under rigid quality controls to make sure they are free of contaminants that could damage capillary tubes and valves.

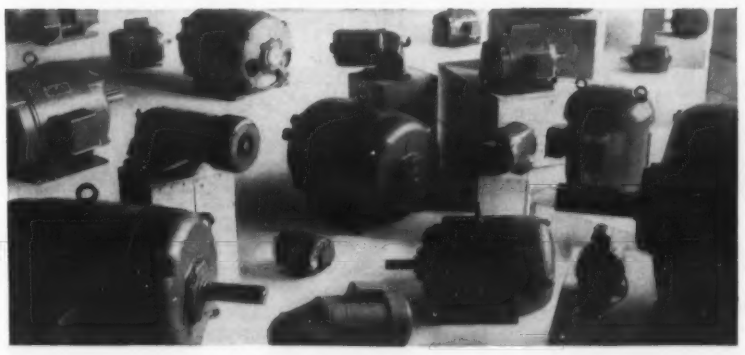
FOR MORE INFORMATION—Please contact your nearest Century Electric Sales Office or Authorized Distributor. You will find Century Electric's new Motor Application Guide helpful . . . please write for bulletin 270A. For *more* than a motor . . .

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

Century 59-8

FROM OVER 10,000 TYPES of motors—AC and DC . . . single phase and polyphase . . . from 1/20 to 400 hp—you can find the right one from Century Electric for your application . . . the one that provides the best performance commensurate with cost.



Cardenas Heads New Marine Dept. For Dunham-Bush

WEST HARTFORD, Conn. — Establishment of a marine department with Henry E. Cardenas as product manager, has been announced by Cecil Boling, president and treasurer of Dunham-Bush, Inc. Cardenas will make his headquarters at the company's New York office, 250 E. 43rd St.

Cardenas

Cardenas, who studied mechanical engineering at the University of Havana, has been engaged in marine refrigeration and air conditioning since 1936 when he joined Carrier Corp.'s marine department. He was chief draftsman at the time he left Carrier in 1944 to become supervisor of the Marine Dept., Airtemp Div. He remained there for eight years.

For five years, Cardenas was chief designer, Air Conditioning Dept., Stevens & Wood, Inc., New York naval architect and marine engineer. For the past year, he has served as project engineer with the Hi-Press Air Conditioning of America.

Santa Fe Orders 200 Refrigerator Cars

CHICAGO—Santa Fe Railway has ordered 200 new temperature-controlled refrigerator cars, according to Ernest S. Marsh, president. Costing more than $5,000,000, the cars will be used to transport fresh fruits and vegetables and frozen foods.

Refrigerated Trailer Test Lab Approved by TTMA

HOT SPRINGS, Va. — First independent test laboratory in the nation for refrigerated trailers was approved by Truck-Trailer Manufacturers Association.

Announcement was made by C. W. Alexander, president of TTMA at the association's 11th annual summer meeting here.

The first approved laboratory is the Budd Co.'s testing facility in Philadelphia.

The facility, built originally to test railroad passenger cars, includes a climate room capable of holding the largest trailers and which has a temperature range from 110° F. to -30° F.

New equipment and instrumentation, calibrated to the methods developed by the National Bureau of Standards, has been installed for rating tests.

The TTMA action climaxes several years of operative study and research by the association, the U. S. Dept. of Agriculture, and the National Bureau of Standards to develop a practical and reliable method of testing the refrigeration efficiency of reefers.

"This is a tremendously significant step forward," Alexander stated, "not only for the entire trucking industry, but also for the frozen food industry and the general public."

It is estimated that about 45% of the annual $2.6 billion of frozen foods travels to processor, to distributor, and to retailer by truck.

Paul Jung, chairman of TTMA's reefer rating committee, said that trailers passing the standards test will be labeled with a TTMA rating plate. The plate will state the B.t.u. rating, manufacturer's identification and year, and name of responsible testing laboratory with date of rating.

"We hope that the TTMA rating plate will become recognized by shippers as a 'Seal of Approval' type of certification assuring them that their goods will be transported safely and under required refrigeration," Jung asserted.

"Initially the committee recommends that ratings be applied only to individual new trailers tested and exact duplicates of these trailers.

"This means a manufacturer may rate a 'prototype' and then all other trailers built to the same specifications will be given a rating plate, provided that the air leakage rate of each subsequent trailer does not exceed that of the trailer tested.

"If the air flow rate is excessive, this must be corrected before the rating will apply.

"The question of how to provide ratings for new refrigerated trailers with customer-requested features differing from standard models, and the problems posed by thousands of reefers now in service throughout the country have been held over for further discussion by the rating committee and the engineering committee," he said.

New, Old Testing Methods Described

Prior to the development of the new rating procedures, measurements of reefer efficiency were made by the "reverse heat flow" method. This consisted of heating the interior of the trailer and determining, by measurement the amount of electrical energy required to maintain a constant temperature, the rate at which heat was flowing out of the body.

John B. Hulse, managing director of TTMA, explained that under the new test each trailer will first undergo an air leakage test. National Bureau of Standards found that the rate of air leakage is a major factor in heat transfer, particularly in the nose of the trailer where the air pressure is greatest while operating on the highway.

Following this test, rating measurements will be made in the climate room with interior of the trailer at 0° F. and room temperature at 100° F. with 50% r.h. A controlled air pressure on the front of the reefer under test will simulate operation on the highway at a speed of 50 m.p.h.

Two methods will be used simultaneously under specified temperature conditions to obtain the heat transfer rate in B.t.u.h.

According to Budd test engineers, each test will take 48 hours to complete, plus time to set up and remove equipment and instruments. For the present, they plan to test one trailer a week. The schedule can be accelerated if conditions warrant.

It was reported that these tests will cost $1,545.

Alexander noted that as the rating program develops, other testing centers will be set up around the country.

FAN CENTER

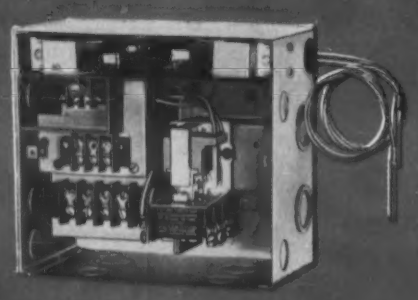
to control air handling equipment

For residential air conditioning systems with remote cooling equipment . . . always use the Penn Fan Center to control the Fan Coil Unit. It saves you installation time and assures most efficient operation. Compact, it combines a transformer with fan relay and heating relay . . . *one or both.* On remote condensing units or water chillers, *specify* the Penn Cooling Center. Both of these "centers" have the latest engineering advances to assure the finest air conditioning performance possible! Remember, when it comes to controls . . .

It's best to buy Penn!

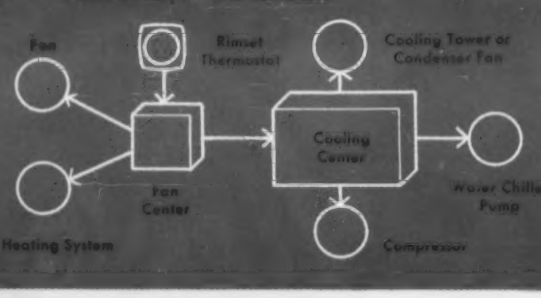
FAN CENTER . . . 6" high, 4½" wide

RIMSET Thermostat



COOLING CENTER . . . 7" high, 8" wide

"FUNCTION" DIAGRAM



PENN CONTROLS, INC. Goshen, Indiana

EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.

AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

Air Conditioning, Soundproofing Provide Hotel Guests Comfort 2 Mins. from Airport

CLEVELAND — When the multi-million dollar Hopkins Airport hotel recently opened at Cleveland's Hopkins Airport, guests were not disturbed by noise from the nearby airfield, only two minutes from the 145-room hotel.

According to the management, principal reason for the quietness was scientific soundproofing enhanced by carefully designed air conditioning. Double pane windows were used to keep out the sound of the zooming air traffic, and air conditioning was provided for each room as well as the public areas.

The year-round air conditioning was installed by R & M Heating & Air Conditioning Co. who used a Carrier combined hot-chilled water system to supply fan-coil units in each room and equipment in the public areas. Each guest room unit is located along the outside wall and has individual controls for both heating and cooling.

Units serving the lobby, coffee shop, and conference rooms are located in a service area and deliver air through ducts, grilles, and diffusers. They are on continuous fan operation with controlled temperature.

On the heating cycle, water temperatures are modulated in accordance with outdoor conditions, while on the cooling cycle, constant temperature chilled water is circuated through the system.

The large double wing hotel is divided into two zones—guest rooms and public areas—permitting simultaneous heating and cooling if required.

A feature of the hotel is a towering two-story high lobby with a glass curtained wall that overlooks the swimming pool.

A large presidential suite includes extra bedrooms and complete kitchen facilities. Free ice cube dispensing units and soft drink cabinets are located in each wing.

Let Water Treatment Contracts on 2 Bldgs.

NEW YORK CITY — Contracts to treat the water used in the air conditioning systems ing at 410 Park Ave. and the of the new 21-story office buildnew 22-story office building at 660 Madison Ave. have been awarded to Water Service Laboratories, Inc., the company announced.

Equipment to be treated in the Madison Ave. building includes the 1,500-ton capacity cooling tower. In the Park Ave. structure, the tower has a capacity of 650 tons.

For Your Reprint Copy
"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.
Only 25¢ each.

DOES YOUR APPLIANCE CARRY THIS SEAL of QUALITY?

☆
The motor used in this equipment is protected against overloads, low voltage, over-voltage with a Mighty Mite Thermal Protector
☆

MECHANICAL INDUSTRIES PRODUCTION COMPANY
223 Ash Street • Akron, Ohio

Home of Michigan Consolidated Gas

New Detroit Skyscraper To Have Gas Air Conditioning, Heating

DETROIT—Architectural details of a new $20,000,000 air conditioned Detroit skyscraper were announced recently with the unveiling of a 7-ft. scale model of the Michigan Consolidate Gas Co. building to be located near the river in Detroit's new Civic Center.

Ralph T. McElvenny, president of Michigan Consolidated, said the building will be the equivalent of 32 stories in height, including 28 floors in the main shaft, topped by a four-story crown.

McElvenny stated that the building would be completely heated and air conditioned with gas. Boilers, air conditioning equipment, and cooling tower will be located in the crown of the building.

Minoru Yamasaki-Smith, Hinchman, Grylls, Associated Architects and Engineers, have combined operations on the project.

Frederick J. B. Sevald, administrator of the project, said the "upside-down" location of the mechanical floors — just under the roof instead of in the sub-basement — is an unusual feature. This saves the cost of deep excavation, he noted.

"Another economy," he said, "is the closely knit design of the structural slab between floors. Less space is consumed because lighting, heating, cooling, phone, electrical, and acoustical components all are sandwiched neatly together in cellular concrete."

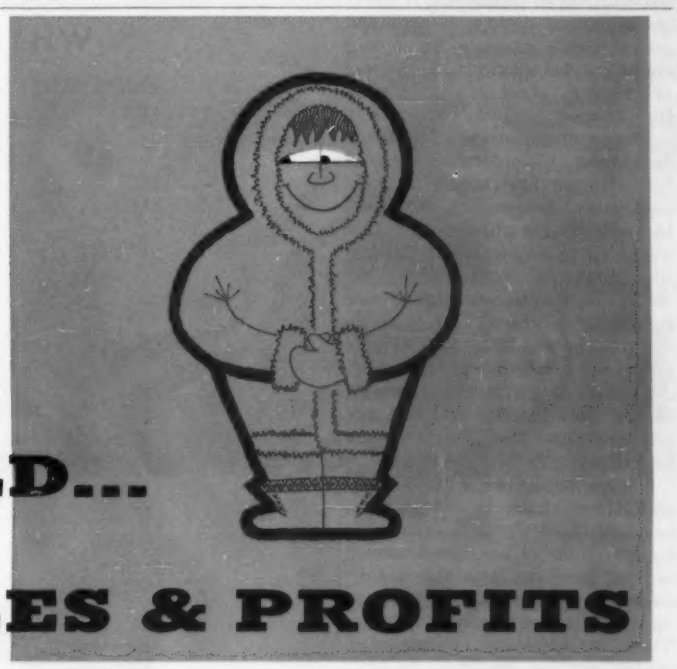
Work on the foundations is expected to get under way early next spring with work on the superstructure starting during the summer of 1960. Completion of the entire structure is expected about the middle of 1962.

Among the other unusual features of the building will be a six-sided window design which eliminates all horizontal lines from the superstructure and emphasizes the vertical columns and window dividers which extend in spires above the roof line.

The 4,800 windows will be in the shape of elongated hexigons encased in stainless steel frames.

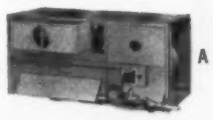
Colored lights will illuminate the crown. The colors can be changed to indicate the weather forecast, McElvenny said.

HOT OR COLD...



SALES & PROFITS

ARE YOURS *with Gaffers & Sattler Furnaces & Air Conditioners*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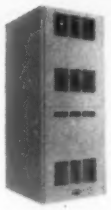
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A. Horizontal Forced Air Furnaces 80-100-120-140,000 BTU. Also available equipped for air conditioning.

B. Counterflow Forced Air Furnaces 80-105-120-140-160,000 BTU. Also available equipped for air conditioning.

C. Upright Forced Air Furnaces Featuring Diamondglas Heat Exchanger 80-100-120-140-160-200,000 BTU. Other upright models, 47-60-70-75*-80*-86*-90-100*-120,000 BTU* (*also available for air conditioning).

D. Self Contained Refrigerated Air Conditioners 3 ton model, includes evaporator and condensing unit.

E. Remote Air Cooled Air Conditioner 2-3-4-5 ton models, fully charged, with precharge refrigerant tubing.

There's never "a slack season" with Gaffers & Sattler Furnaces and Air Conditioners. They've all the exciting features your customers will demand...selling features that pay off in your order book.

So, when it's hot as a Zulu's hut...or cold as an Eskimo's igloo, the complete line of Gaffers & Sattler Furnaces and Air Conditioners will make profits rise. They're easy to install...right for every type of installation...and they're backed by over 33 years of manufacturing experience. Every Gaffers & Sattler comfort appliance is quality controlled...is thoroughly tested in our research and development laboratories to assure the highest standards of operation and service.

Contact your jobber or write today to:
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Manufacturers of Gaffers & Sattler Air Coolers, Automatic Gas Ranges, Furnaces, Air Conditioners and Water Heaters

GAFFERS & SATTLER
A PRODUCT OF
UTILITY
APPLIANCE CORP.

Trend Toward Higher Voltages--

(Continued from preceding page)
may be doubled, but that is several or many years away.

Today, though, there is increasingly widespread application of the so-called 265/460-volt wye system in commercial areas to serve larger stores, office buildings, and apartment buildings.

This is also sometimes designated as 277/480 volts. Voltage designations nowadays, it might be pointed out, are largely nominal, like lumber and pipe sizes, as is obvious to anyone who's observed an accurate voltmeter in operation.

265/460-Volt System Started In World War II

The 265/460-volt system was developed during World War II to serve fluorescent lighting and 440-volt three-phase motor loads in industrial plants. It provided considerable savings in wiring costs besides minimizing the use of scarce strategic materials like copper.

This voltage system has since developed considerable appeal for utilities and some of their customers, despite the fact that the only single-phase appliances available in any quantity for the line-to-neutral voltages of 265 volts are fluorescent lights and resistance heaters. This is some demand for 265-volt single-phase air conditioners, however.

Transformers are necessary to use conventional 230-volt appliances on the 265/460-volt system.

Theoretically, a standard 440-volt three-phase motor can be used on the 460-volt side of this system. This is because a motor is designed to operate safely over a range of plus or minus 10% of its nameplate voltage. Thus, a 440-volt (nameplate) motor can be expected to give satisfactory results over a voltage range of 396 to 484, and it almost always does. As a matter of fact, many motors have a slightly greater range than plus or minus 10%.

Power Supply Variations Often Cause Trouble

Trouble is the power supply can also be plus or minus 10%. There is seldom a problem if, for example, a 440-volt motor is used on a 440-volt line and the supply voltage varies within the allowable range.

Supposing, though, a 440-volt motor is used on a 460-volt line, which varies 10% either way. If the supply is running 10% on the minus side, this means a voltage of 414, which is theoretically well within the range of the motor. But if the supply is 10% on the plus side, that means 506 volts, somewhat over the maximum 484 volts the motor was designed to handle.

The problem can be further complicated if, as in many cases, the utility is aiming at 480 volts rather than 460. At least one utility serving most of a major industrial state does so, but tries to hold its maximum voltage to 500 volts, which is still a bit high for the theoretical 484-volt practical limit on a 440-volt motor.

Has this high voltage caused any service difficulties with hermetic units yet?

Answer to this has been difficult for the industry to pin down. For one thing, there haven't been so very many applications of 440-volt units to 480-volt lines thus far.

Where problems have been encountered, there usually turn out to be other factors contributing to motor failure, or so it seems. Improper wiring, for example, is not unusual.

Excessive Voltage Hard To Prove

Then, too, it's pretty difficult to prove that excessively high voltage actually occured, points out one executive of a compressor manufacturer, who for a number of years was a utility employe.

Usually, no accurate check of voltage is made until after a burn-out has taken place, he says. When that occurs, it's very easy for the utility to lower (or raise) supply voltages, at least while the voltage is being checked, he adds, perhaps somewhat cynically.

While the high voltage might not in itself cause burn-outs, it can lead to nuisance trip-outs of hermetic motors. Such trip-outs do no harm, as a rule, but because they are a nuisance, almost inevitably something is done in the field to prevent or minimize their occurrence. And when such trip-outs are prevented, something else has to give eventually. Usually it's the motor windings.

On the other hand, a utility executive seriously questions whether in actual practice much if any trouble can really be attributed to high voltage. While voltage of the power delivered to the consumer might be on the high side, he readily admits, he strongly suspects that poor or inadequate wiring on the premises will reduce this considerably.

Certainly, he can point to past complaints of the industry about the problem of low voltage at the motor terminals, which has sometimes been the case with installation of window units in an apartment building, for example.

The whole problem could be solved, of course, as far as utilities were concerned, if hermetic unit manufacturers would simply design and produce motor-compressor units for voltages in current use, and those expected to be in use shortly.

With the possible exception of the so-called 265/460-volt system requirements, the refrigeration industry is already meeting current demands, which we'll mention later.

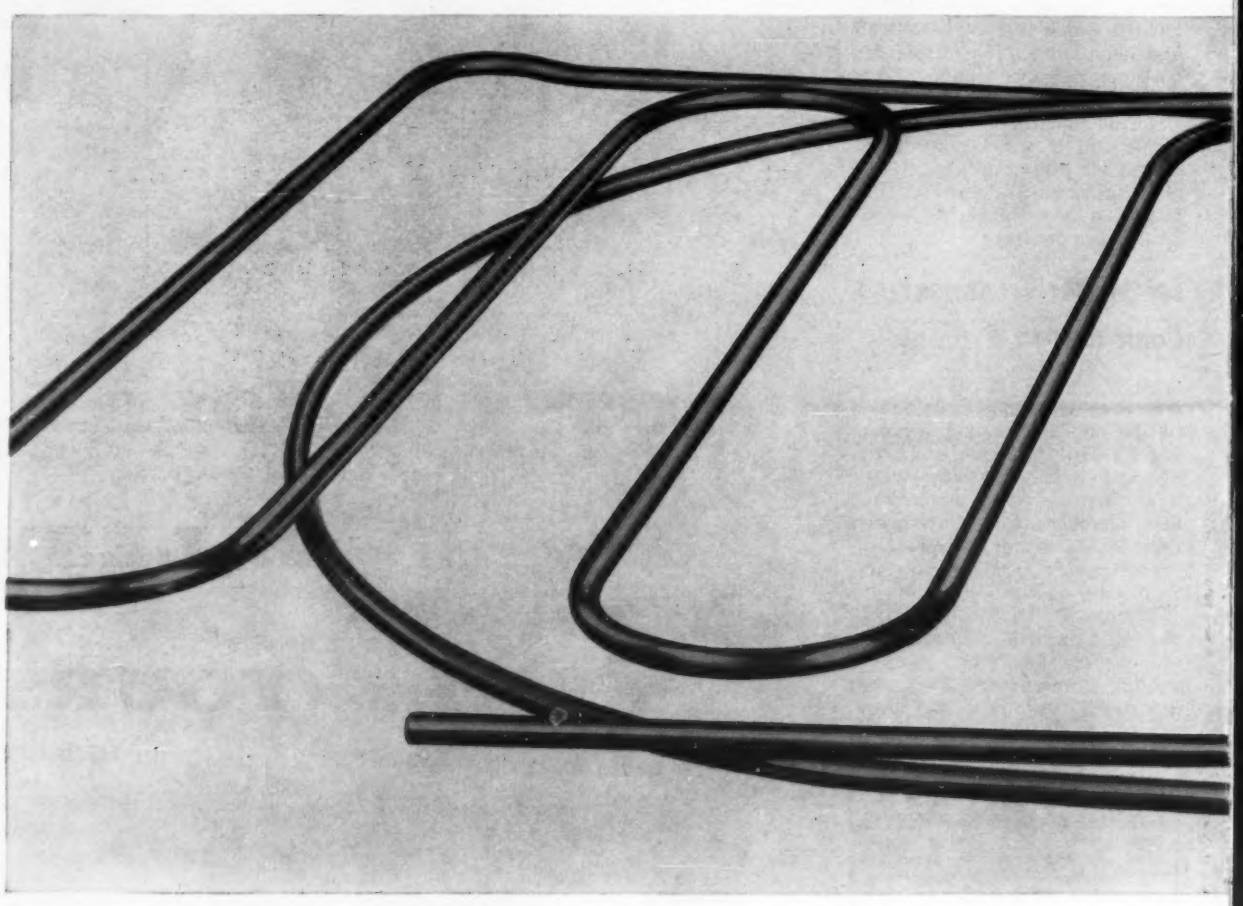
But there's no agreement among utilities as to which way they're going and how soon they'll get here as far as higher utilization voltages are concerned. Some, as mentioned, seem committed to the 265/460-volt system. Yet many experts connected with power companies see the 240/416-volt system as more practical.

So, should compressor manufacturers prepare to make 460-volt hermetics or 416-volt units? A nominal 440-volt unit will not work on both, at least not at the extremes of plus or minus 10% of both nominal voltages, which would represent a range of 364 to 506 volts.

The problem for the refrigeration industry, as for the utilities, is primarily one of economics.

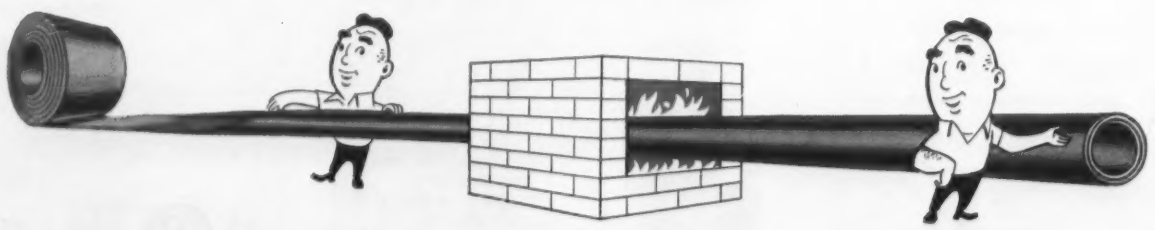
Motor engineers see no reason why an efficient hermetic motor could not be designed and produced for operation at 460 volts or 416 volts (though not both). It would cost money, however,

WHY BUNDY LEADS IN MASS-FABRICATION:



EXPERIENCE ... Another reason why

Bundyweld serpentine coils are mass-produced by the million on specially designed machines ... each to your exact specifications



Bundyweld starts as a single strip of copper-coated steel. Then it's continuously rolled twice around laterally ...

into a tube of uniform thickness, and passed through a furnace where copper coating fuses with basic steel.

Result: Bundyweld Tubing—double-walled, beadless, metallurgically bonded through 360° of wall contact.

for efficient designs are not arrived at over night, nor are manufacturing facilities readily changed at insignificant cost.

Lack of Agreement Will Raise Cost To Consumer

A much worse possibility (and it does seem to be a possibility) would be for utilities to "ride off in all directions" with the result that they and their customers would expect 416 and 460-volt hermetic compressors *in addition to* the types presently available.

If such conditions should prevail, the cost to manufacturers and stocking wholesalers could be somewhat staggering, and most if not all of the cost would be borne by the consumer, obviously.

Consider, for example, the *standard* motors offered by Copeland Refrigeration Corp. in its hermetic line. There are six major ones:

Single phase 115, 208, and 230 volts; three phase 208/220, 416/440, and 550 volts (the latter for Canada), not to mention 220-volt two-phase motors required in downtown Philadelphia.

The above are considered as standard, mind you. The problem of *special* motors is being ignored in this discussion.

Motors are not the only part of the hermetic problem, of course. There are different sizes and refrigerants to be considered.

What with the various combinations of motors, bores, strokes, and refrigerants, Copeland now lists approximately 460 different models. Copeland has as many as 18 different ¾-hp. motors on its Copelametic line; 11 different ¾-hp. motors on its all-welded units; 23 different 1-hp. motors on its Copelametics; 12 different 1-hp. motors on its welded jobs.

If additional voltages also have to be provided, manufacturing costs will naturally soar.

Wholesaler Stocks Would Have To Be Increased

That's not all, however. Currently, Copeland's authorized wholesalers are required to keep in stock a minimum of two each of 93 different motor-compressor units. Some wholesalers in some areas stock considerably more than two each of certain popular models.

All this costs money.

But if hermetic units for additional voltages have to be designed, manufactured, and stocked, too, the cost will be a great deal more.

Key word in the preceding sentence is "additional." Although it would take some time and cost some money, a carefully planned and organized transition to higher voltages would impose no great hardship on motor and compressor manufacturers, wholesalers, and customers, provided that certain voltages now in use would be dropped.

Even this would not be a simple problem, it must be remembered. Motors designed for higher voltages could require, or permit, some changes in hermetic compressor bodies, but this could be scheduled over a period of time.

Changing open motors, of course, could run into money, but changing a hermetic motor-compressor would cost much more.

Obviously, it would not be simply a matter of changing motor, pulley, and/or belt for hermetic units. The whole motor-compressor assembly would have to be reworked. To keep customers "in business" as it were, this probably would be done on an exchange basis.

With careful planning, though, the problem would not be insurmountable. Systematically changing motor-compressor units already in the field would cost a certain amount, but this could be justified or offset against the number of years the unit had been in use.

The industry is hoping a reasonable solution to the problem of increased utilization voltages can be worked out. Committees of Air-Conditioning & Refrigeration Institute are working with their counterparts in National Electrical Manufacturers Association and Edison Electric Institute on the problem.

Trane Elects 3 Vice Pres. In Sales, Mfg.

LA CROSSE, Wis. — D. C. Minard, president, The Trane Co., announced the election by the board of directors of three vice presidents in the sales and manufacturing divisions.

Dackis

Graham

Cantwell

William C. Dackis and William D. Graham, Jr., are promoted to vice presidents in the sales division and John D. Cantwell, Jr., is made vice president, La Crosse manufacturing.

Dackis, former manager, heat transfer sales, is now vice president, heat transfer sales.

Graham has been promoted to vice president, sales offices. He will be in charge of all Trane sales offices in U. S. and will report to A. C. Menke, vice president, heating and air conditioning. Graham has been manager, eastern sales region.

Cantwell was formerly works manager.

Literature Available On Water Treatment

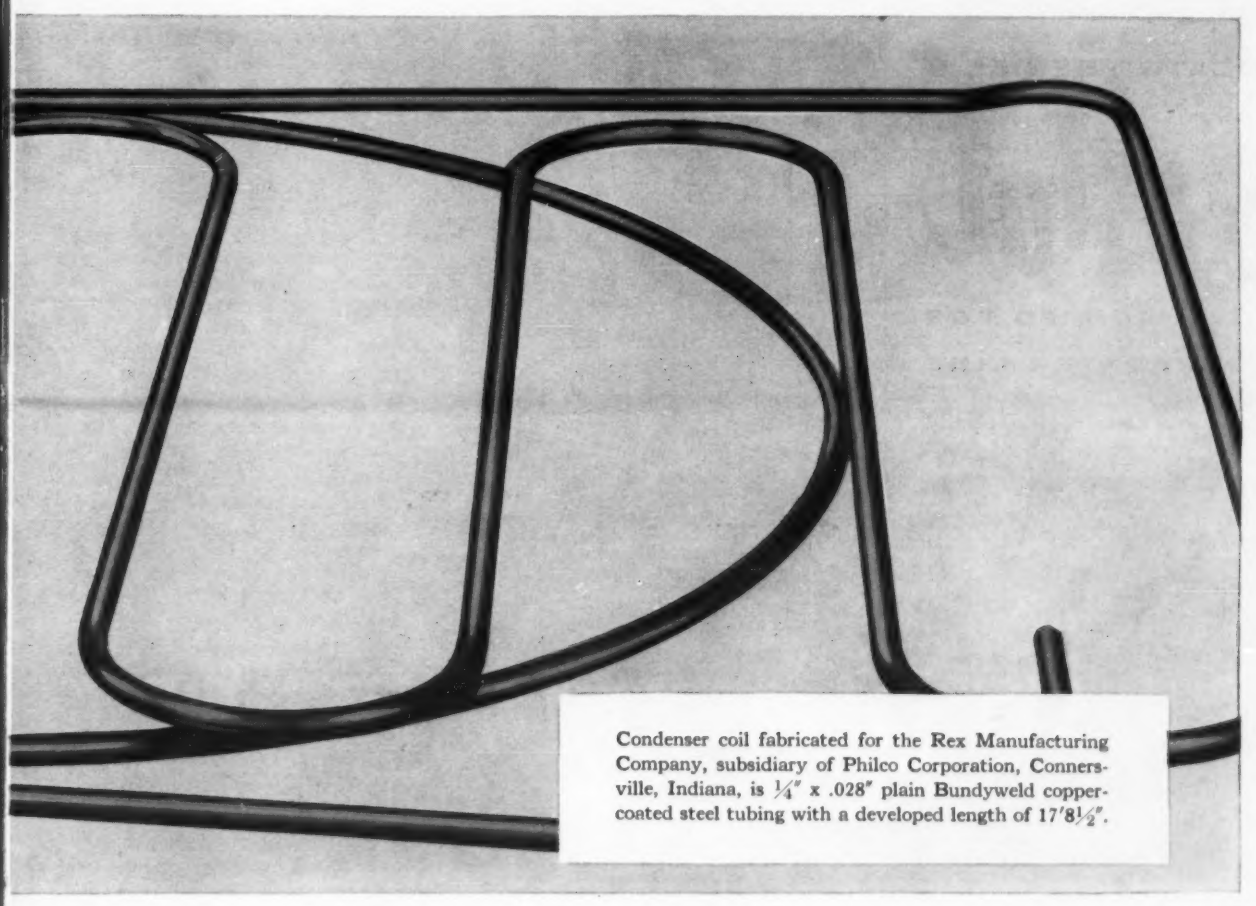
NEW YORK CITY — Literature on the treatment of water in central air conditioning systems has been published by Water Service Laboratories, Inc.

The question-and-answer bulletin includes hints on corrosion and scale prevention, problems in closed circulating systems, and control of slime and algae. Requests for free copies of the literature, known as Bulletin AQ59, should be addressed to Water Service Laboratories, Inc., 615 West 131st St., New York City 27.

For Your Reprint Copy

"Short, Short Course in Air Conditioning Fundamentals." By D. C. Schaffer. Mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Only 25¢ each.



Condenser coil fabricated for the Rex Manufacturing Company, subsidiary of Philco Corporation, Connersville, Indiana, is ¼" x .028" plain Bundyweld copper-coated steel tubing with a developed length of 17'8½".

you get precision in Bundyweld parts

Mass-produced serpentine coils like the one shown above must meet two requirements: they must be fabricated to close tolerances . . . and they must be turned out at minimum cost per coil.

Skilled technicians—plus years of experience as the largest supplier of steel tubing to the refrigeration industry—help us do both these things. We have developed machines and fixtures that treat every twist and bend as a mass-production operation. Result: tubing parts that meet your close tolerance requirements and give you *mass-production savings*. And you get two additional benefits:

Double-walled tubing. Bundyweld, the safety standard of the refrigeration industry, is double-walled from a single steel strip . . . withstands severe vibration stress.

Expert design service is free. Solving tough problems is our design engineers' business. They'll show you short cuts that cut costs without sacrificing quality or compromising engineering standards.

It will pay you to check *first* with Bundy®. You'll get unmatched engineering and fabrication service . . . plus *leakproof* Bundyweld tubing. Call us today!

BUNDY TUBING COMPANY • DETROIT 14, MICH. • WINCHESTER, KY. • HOMETOWN, PA.

WORLD'S LARGEST PRODUCER OF SMALL-DIAMETER TUBING • AFFILIATED PLANTS IN AUSTRALIA, BRAZIL, ENGLAND, FRANCE, GERMANY, AND ITALY

There's no real substitute for

BUNDYWELD® TUBING

Bundyweld and Bundy specialty tubings are sold through distributors in principal cities

Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)

button. These mattresses are heated internally.

Separate radios and bookshelves are set on both "His" and "Her" sides. Plus telephone, electric shaver, and tape recorder for business dictation on "His" side.

Velvet-lined jewel box, vibro massager, automatic tea-maker and silver tea set are attached to "Her" bed.

Television for both, plus a pushbutton control panel which will open or close bedroom curtains, switch off bedroom lights, and communicate with every room in the house, go along, too.

"Why not go to bed with everything you need—television, books, knitting, telephone—at your finger tips?" the Slumberland director asks. "After all, Sir Winston Churchill has done some of his best work lying on his back."

Comes to mind at this point a nightmare of a man being shaved involuntarily, scalded with hot coffee, and folded up in cold mattresses while his screams are recorded on tape.

Walter Reuther may have something to say about this.

Come to think of it, Jimmy Hoffa probably already has a Superbed.

Lucky Grandchildren

What will the world be like when your great-grandchildren marry?

Smaller, for one thing—New York to Paris will be a two-hour jaunt. More crowded for another—five billion people—in place of the two billion on earth today.

In fact, to hear the experts talk, about the only resemblance between this old planet in 2060 and the one we live on today will be—its roundness.

Take travel. Though planes now zip through the air at 600 m.p.m., our descendants won't even speak of miles. They'll talk about "Mach 6" or "Mach 8," meaning six or eight times the speed of sound.

Cruising speed will be 2,500 m.p.h. and New York-to-Los Angeles passengers will have to get used to arriving at their destination "before" they leave (thanks to the time differential).

By the end of this century, 200 million cars and trucks, in place of our present 60 million vehicles, will be rolling along superhighways. You'll be able to drive coast to coast and border to border without one light to slow you down.

Yet you'll be safer than ever. Electronic highways, with a strip of stainless steel running down the center of each lane, will keep your car at a suitable distance from those in front and back of you, even "talk" to a brain in your car that will allow you to cruise at a constant speed.

Homes will be round and domed (fully air conditioned, of course). Walls will slide or fold up to expand any room in the house. Color will be everywhere—and if you ever tire of a particular shade, it may be cheaper to replace the wall than to paint.

Windows will shut automatically as soon as a raindrop touches them. Housewives will shop from their living room easy chair—via TV hookups with supermarkets.

No Money?

Clothing will be lightweight, informal—sometimes even disposable (paper will be the secret). There won't be so many pockets in clothing, either, for instead of money, "electronic pocketbooks" will take care of bills.

The latter will be about the size of an ordinary identification card. When a customer makes a purchase, the price will be noted electronically on his card.

This information will be transmitted from the store to a central bank, where the proper amount will be deducted from the customer's account and transferred to the sellers.

Your great-grandchildren will be able to look forward to 100-125 years of life. Many killing diseases will be only memories. Cancer, hardening of the arteries, and rheumatic heart disease will be as rare as a smallpox is today. Mental illness will be gone for good.

Painless dentistry may become just a memory as chemicals are developed to prevent tooth decay.

With more people living longer than ever, certain problems will arise—living space, jobs, food. But the solutions will be found too.

Biggest problem of all—at first look—is food. Where will all the food for five billion people be obtained?

Super efficient farming methods will provide much of the answer. There is reason to believe that farmers in the 21st century will have "intelligent" tractors, radio-controlled or tape-instructed.

Already, at least one company—Massey-Ferguson—is experimenting with radio control.

Massey-Ferguson researchers aren't saying much about push-button farming, but their experiments are far enough along that unmanned tractors already are working fields in test operations.

Farming, of course, will zoom to new heights of mechanization. It should one day be possible, in fact, to program the entire farming operation on tape and leave the farm to run itself from a master computer panel.

New machines, fertilizers, weather-protection devices and chemicals will assure bountiful yields—good weather or bad. By the time population grows to five billion (perhaps by 1990, according to statistical experts of The Population Council) farm production will have increased 10-fold — ending the near-starvation diets prevalent among more than half the world's people today.

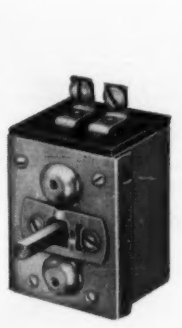
Farms may even move indoors, with soil gliding on conveyor belts past "service" stations. Under plastic domes, man-made sunlight will improve animal husbandry.

NEW WILCOLATOR SERIES G

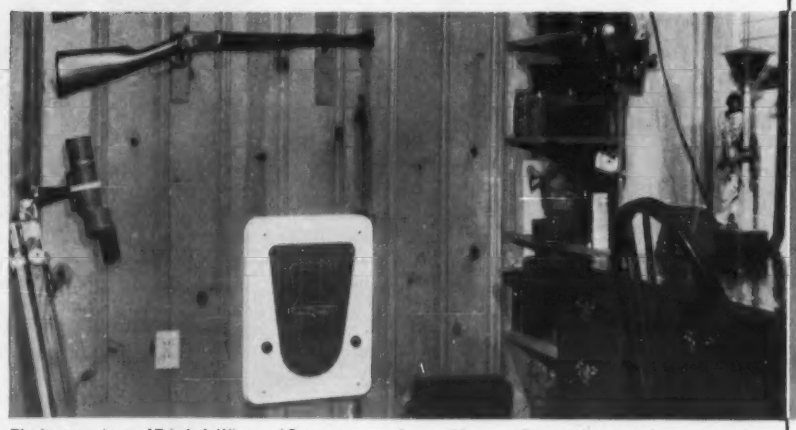
thermostat

SPECIFIED FOR Chromalox HEATER LINE

Picked for its compactness, low cost, high capacity



Wilcolator Type G1 single-pole, remote-bulb liquid expansion thermostat for electric heating applications



Photos courtesy of Edwin L. Wiegand Company, producer of famous Chromalox electric space heaters

Edwin L. Wiegand Company is one of several leading manufacturers of electric space heaters that have standardized on the new Wilcolator Type G1 thermostatic control. They find it offers significant advantages from both an engineering and cost standpoint.

For example, the improved snap-action switch mechanism of the G1 provides much higher contact ratings than were previously available in such a compact unit (2¾ x 1⅝ x 1⅞ in.). This permits smaller, more efficient control panel assemblies and thus helps simplify problems of flush installation.

At the same time, the G1 is generally priced lower than its bulkier counterparts—a welcome saving to the manufacturer. Equally important is its reliability—a reflection of Wilcolator's 20 years' experience in designing and producing space heater thermostats. For complete information on the G1 control, write The Wilcolator Company, 1001 Newark Ave., Elizabeth, N. J. *In Canada:* Wilcolator (Canada) Ltd., 221 Evans Ave., Toronto 14, Ont.

SPECIFICATIONS

Temperature range: 0°F min.; 585°F max. Special temperature ranges: to your requirements

Contact rating: 30 amp, 125 and 250 volts a-c noninductive load

Standard shaft: ¼ in. diam. flatted to .156 in. Length to your requirement. Special shafts available

Dials: Standard or special dials, pointers, and chrome bezels available

Terminals: Screw type, AMP or Arkles

THE Wilcolator COMPANY

MANUFACTURERS OF LIQUID EXPANSION ELECTRIC THERMOSTATS FOR:

ELECTRIC RANGES • ROOM COOLERS • AIR CONDITIONERS • CLOTHES DRYERS • SPACE HEATERS • ROLL WARMERS • ROASTERS • FRYERS • STEAM TABLES • WARMING OVENS • RANGETTE OVENS • WATER HEATERS • BAKE OVENS, ETC. • STOCK WATER HEATERS • RESTAURANT APPLIANCES • VENDING EQUIPMENT • PACKAGING MACHINERY • PHOTO DRYERS • BLUEPRINT MACHINERY, ETC.

ALL WILCOLATOR THERMOSTATS ARE UL AND CSA APPROVED AND LISTED

Hussmann Refrigeration, Inc., has an opening for Divisional Sales Manager with experience in selling in the commercial refrigeration field. Please send complete resume to Hussmann Refrigeration, Inc., 2401 N. Leffingwell Ave., St. Louis, Mo. Replies will be held confidential.

the quality tells . . . the quality sells

JANITROL

packaged air conditioner

Flexible and compact—
fastens to ceiling or
stands upright on floor . . .
adaptable for duct system.

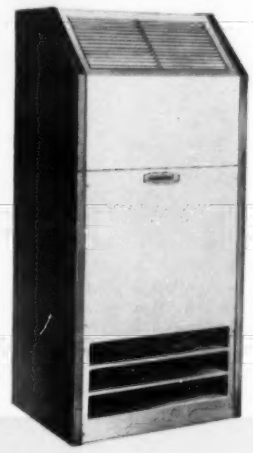
Easy solution to a wide range of residential and commercial cooling problems . . .

new JANITROL COMPACK

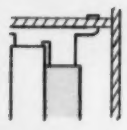
"packaged" waterless cooling conditioner

This versatile new cooling conditioner lends itself to an exciting variety of cooling applications . . . meets your need for maximum cooling efficiency in little or no floor space at all!

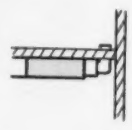
It is designed for free air discharge or use with a duct system . . . may be suspended overhead or positioned on the floor. *Waterless* operation assures quieter, thriftier operation—establishes a new concept of cooling performance. The complete refrigeration assembly is housed in a remote air-cooled unit that's engineered for comfort-cooling with outside air temperatures to 125° F.



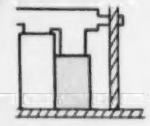
For your next residential or commercial job, provide controlled, high-efficiency cooling free from objectionable noise and drafts with the Janitrol Compack . . . one of Janitrol's complete line of conditioners for cooling and heating-cooling applications. Ask your Janitrol representative for full details.



Janitrol "Compack" in parallel with warm-air "up-flow" furnace completes a year 'round comfort system.

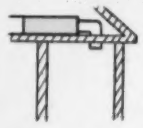


In basements with low headroom, "Compack" saves space—may be suspended from joists and utilize existing warm air ducts through a by-pass system.



Janitrol "Compack" blower coil unit with up-flow furnace in first floor closet or utility room.

"Compack" installed overhead in an office. Whisper-quiet, it never intrudes to disturb busy people.



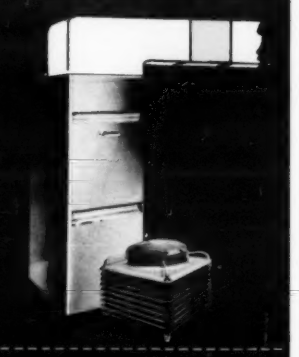
Janitrol "Compack" in attic—cools entire house through small ducts feeding diffusers near ceiling of rooms below.

"Compack" feeding a duct system in modern store. Several "Compack" units can be combined to meet a variety of cooling needs—provide zone control where desired.

"Compack" installed upright on the floor in restaurant. Draftless, free-air discharge.

ARCHITECTS, ENGINEERS AND CONTRACTORS INFORMATION SERVICE

Write today for complete specifications on Janitrol cooling and heating in buildings of every type. There's no obligation.



JANITROL

WIN-SUM-MATIC

Year 'round conditioner

Combines thrifty gas heating, waterless cooling in little as 3-3/5 sq. ft. of floor space. Famous 20 year warranted Dura-Tube heat exchangers. Unique by-pass gives correct air flow for heating and cooling without seasonal adjustments. Air cooled Pride O' Yard unit is low, sleek, efficient . . . ADD-ON cooling option—install for heating only, add cooling later. Upflow and downflow models, 80,000 to 200,000 btu./hr. (to 120,000 on down flow) heating, 22,000 to 76,000 btu./hr. cooling capacities*.

SRA add-on cooling

Adapts most any warm air furnace for thrifty, efficient central cooling. Cooling coil mounts in duct, beautiful air cooled Pride O' Yard unit goes outside. Powerful, quiet performance with outside temperatures to 125° F. Easy to install. Waterless operation eliminates plumbing, sewage, water supply problems. 22,000 to 76,000 btu./hr. Capacities*.

Gas-fired Duct furnaces

Designed for installation in a duct where the air is circulated by a separate blower. Especially adaptable for industrial heating applications in combination with cooling. DUCT Series 55 in five sizes from 85,000 to 225,000 btu./hr. Series 75 in sizes 200,000 and 300,000 btu./hr. may be combined to provide unlimited capacity range.

CAPACITIES*

SRA-7—22,000 btu.
SRA-9—35,000 btu.
A-401 and 403—47,500 btu.
SRA-11—58,500 btu.
A-603—76,000 btu.

*95° F. Dry Bulb air entering condenser, 80° F. Dry Bulb, 67° F. Wet Bulb air entering evaporator, approximately 400 CFM per 12,000 btu.

JANITROL®

HEATING AND AIR CONDITIONING DIVISION

Surface Combustion Corporation • Columbus 16, Ohio

In Canada: / Moffat Heating & Air Conditioning Division Moffats Ltd., Toronto 15

Also Makers of Surface Industrial Furnaces, Kathabar Humidity Conditioning, Janitrol Residential Heating and Cooling Equipment

Fixture Firm Names Hanson and Pierson

LOS ANGELES — National Refrigeration Mfg., Inc., manufacturer of supermarket fixtures, announced that A. L. Hanson, who joined the firm in 1956 as chief engineer,

A. L. Hanson

R. Pierson

has been named president.

He succeeds Charles L. Walling, who has retired from active management as president of National Refrigeration Mfg. and National Refrigeration Sales.

Walling, also this year's president of the Refrigeration & Air Conditioning Contractors Association (national), has retired, upon advice of his physician, from that activity, too.

Known for 35 years in the refrigeration industry, he will function as chairman of the board, National Refrigeration Mfg., and will assume periodic assignments, too, it was stated.

In another announcement, Hanson made known the appointment of Ralph Pierson as sales manager. He was formerly installations supervisor at National's manufacturing facility in Van Nuys.

National's present marketing area is defined as Greater Los Angeles, San Diego, Bakersfield, San Francisco and environs. Immediate plans are indicated by Hanson to include distribution outlets in northern California, the Pacific Northwest, and Arizona and Nevada.

Secondary phase of the reorganization under Hanson includes expansion to the 11 western states. A national marketing pattern is also indicated in long-range planning.

The firm's administrative and sales offices are located at 4106 W. Jefferson Blvd., with the manufacturing facility at 7570 Woodman Ave., Van Nuys.

Plans Shaping Up For 3rd Western Exhibit, Conference

LOS ANGELES—Plans are shaping up for the 3rd Western Air Conditioning, Heating, Ventilating & Refrigeration Exhibit & Conference to be held April 27-30 in Shrine Exposition Hall here, according to William P. Tennity, president, Western Air Conditioning Industries Association, the sponsor.

There will be exhibits and speakers from all parts of the country, it was pointed out.

Technical programs will be under the chairmanship of Arthur Hess, vice president. These are set for the show's final three days and are designed as follows: April 28, Engineer's Day; April 29, Contractor's Day; April 30, Journeyman's Day.

Fred J. Tabery, exhibit manager, is issuing information on display space from his office at 3443 S. Hill St., Los Angeles 7.

Southernair Buys Plant To Expand

DURHAM, N. C. — Announcing a major expansion program for Southernair Co., wholesale air conditioning concern, Sterling J. Nicholson, president, said he and his sons, Henry and Sterling Nicholson, Jr., have purchased the Cheek-Holton Mfg. Co. plant on Pettigrew St. and will move operations there.

The Cheek-Holton buildings will be razed and a new combination office-warehouse building will be erected. Part of the new structure, to contain 40,000 sq. ft. of floor space, will be used for Southernair, Nicholson said, adding: "We would like to develop the rest of it for other wholesale operations."

Southernair is presently located in an 18,000-sq. ft. building on Ramseur St. The firm covers North and South Carolina and Virginia.

RACCA Service School In Chicago Ends Third Year, Presents Certificates

CHICAGO — A dinner at Como Inn concluded the third year of the RACCA of Chicago Servicemen's Training School.

These first three years of the four-year program included courses in principles of air conditioning and refrigeration; controls; and intermediate servicing.

Schooling costs of the trainees are paid by their employers, who are contractor-members of the association, it was noted.

Guest of honor at the dinner was Francis X. McCartin, business manager of Pipe Fitters' Local No. 597 of the United Association, the union with which these servicemen are affiliated.

Others in attendance were the students, instructors, employer-members of RACCA of Chicago, as well as members of ARW Region 6.

Certificates were presented to the students covering each of the courses completed. In addition, special awards comprised of 17 merchandise certificates, ranging in value from $20 to $5, were presented to the trainees for over-all performance and good attendance.

ARW Region 6 shared equally with RACCA of Chicago in the donation of these merchandise certificates. Madden Brass Co. also donated three special merchandise certificates for products manufactured by them.

It was also reported that more than 250 industry men gathered recently at Silver Lake Country Club at Orland Park for the annual golf tournament sponsored by RACCA of Chicago.

All factions of the industry were entertained by the contractors; the wholesalers, manufacturers, and their representatives; officials of Pipe Fitters Local No. 597, and the City Inspection Dept.—and even other contractors.

The all-day tournament was followed by a social get-together.

The trophy presented to the association by the Chicago wholesalers — ARW Region 6—was won this year by Earl A. McLean of Merchants Commercial Refrigeration, for the lowest net (Peoria) score. Low gross for the contractors brought first prize to George T. Howe of Accurate Heating & Cooling Corp., and William E. O'Connor of Acme Furnace Fitting Co. won first low gross prize for guests.

Fast defrost! Economical operation!

LARKIN
ELECTRIC DEFROST
LOW TEMPERATURE
HUMI-TEMP

Here's the unit for the cooling jobs below 32°F. The automatic electric defrost keeps the coil free of ice without overheating—enables the evaporator to function at greater efficiency and lower operating costs. Independent defrosting and refrigeration circuits give dependable, trouble-free service.

Complete Defrost

Sealed tubular heaters are integral parts of the coil. They defrost by *radiation, conduction, and convection*—work fast so the coil can work best.

Fully Adjustable

The defrosting cycle is controlled by a time clock. It can be adjusted for any number of defrosts a day and for any length of time from 2 to 55 minutes.

At the end of the defrost cycle, an adjustable delay period allows the compressor to start before the fans to prevent a blast of warm moist air from entering the refrigerated area.

Investigate the many advantages of the LARKIN Electric Defrost Low Temperature Humi-Temp.

For complete data, see your wholesaler or write for bulletin number 1055.

REASONS WHY YOU'LL BE GLAD YOU BOUGHT IT

- Patented Larkin Cross-Fin Coil—aluminum fins and staggered tubing.
- Heating elements easily removed and installed through side access panel.
- Drain pan has conductive rubber electrical heating pad which assures complete drainage.
- Standard permanently lubricated heavy-duty motors designed for low temperature applications—resilient mounting on adjustable slotted base.
- Heat exchanger provided as standard equipment.
- Heavy gauge, die-stamped aluminum case, finished in Larkin Blue.

BASIC RATINGS

Model	Capacity Btu/hr @ 10° TD F	Total Surface Area	Cfm	DEFROST DATA Coil Heater Watts	DEFROST DATA Drain Heater Watts
ELT-26	2600	69	800	800	155
ELT-32	3200	79	1000	1200	155
ELT-42	4200	98	1400	1500	240
ELT-52	5200	131	1550	1500	300
ELT-65	6500	150	1700	2250	300
ELT-82	8200	201	2200	2250	300
ELT-104	10400	226	2800	3000	420
ELT-130	13000	301	3200	3600	540
ELT-160	16000	401	4400	4800	540
ELT-240	24000	501	5600	5600	660

WATCHDOG OF THE NATION'S FOOD AND COMFORT ©LARKIN

LARKIN COILS INC.
519 MEMORIAL DRIVE, S.E., ATLANTA, GEORGIA

'Gas Air Conditioning Betters Profit'

'Selling Equipment, Not Prices,' Builds Volume for 4-Year-Old Contractor

With gas air conditioning now coming to the fore, the NEWS believes it will be of interest to many readers to describe how a typical contracting firm looks at this business and how it sells gas units. Here are some details on the operational methods and cost-cutting ideas of such a firm, Dodson & Cochran Air Conditioning Co. in Bartlesville, Okla.

ARMED with sales literature, George Dodson makes his sales "pitch" to a gas air conditioning prospect.

BARTLESVILLE, Okla.—George Dodson and Jack Cochran, in the air conditioning and heating contracting business here less than four years, already have demonstrated that "selling equipment, not prices" builds both volume and customer confidence.

Dodson & Cochran Air Conditioning Co., in which they are equal partners, began operation in late 1955 with an electric air conditioning line. The company branched out in March, 1958, by adding Arkla-Servel "All-Year" gas units—a move which both agree has contributed substantially to their sales potential and flexibility of operation

"Taking the Arkla dealership has given us another quality line of equipment—and something new—to sell," says Dodson. "During our first year ending this last March 31, we installed 36 Sun Valley combination gas cooling and heating units. We expect to do better than that this year." The ratio of electric to gas unit sales has been running about three to one, he adds.

75% of Air Conditioning Work Is Residential

He estimates that about 75% of their air conditioning business is residential and 25% commercial, with about 60% of the residential units so far going into existing homes, many as "add-on" jobs. Furthermore, only about 15% of the concern's total sales is in heating.

"The volume of profit is better with air conditioning," Dodson explains, "especially since the cooling season is relatively long here, about 1,500 hours." The company also has been selling from 60 to 100 window units a year, and handles filters, and other miscellaneous items.

Business Is Nearly A Turnkey Operation

Dodson & Cochran is practically a turnkey operation, handling all of its own sheet metal and piping work. Dodson, 39, takes care of the front office—sales, purchasing, finances, and engineering and layouts—and Cochran, 38, heads up the installation and service end of the business.

"We wouldn't have it any other way," Cochran points out. "Doing most of the work ourselves facilitates scheduling of jobs, eliminates many of the problems frequently involved in dealing with subcontractors, and makes bidding a little easier. Now we're considering putting an electrician on the payroll."

This doesn't mean, however, that the firm readily under-bids its seven Bartlesville competitors. "Quite the contrary is true," Dodson notes. "On most jobs, our bids run a little higher, usually by 10 to 15%.

"But we feel this works more to our advantage than disadvantage. Our equipment is a bit higher-priced. We sell quality, both in installation and service and in the units themselves. This has helped build up customer confidence—and business. A good evidence of this is the fact we haven't done too much advertising so far. Usually, prospects just hear about us, come in or call, and buy.

"Then, too, we have never believed in bidding low just to get a job. We feel if we can't make our fair profit on an installation, we don't want it. Generally, we figure on the basis of a 25% markup—15% for overhead and 10% for profit."

Another factor is that Dodson & Cochran has an all-union shop, with wages running substantially higher (generally $3.50 an hour and up) than most of its competitors. The company's 13-employe work force includes seven sheet metal men (three crews), two pipefitters, two servicemen, and one general handyman. One secretary works in the front office.

Besides endeavoring to foster a reputation for good work, technical know-how, and quality equipment, the firm, in tracking down prospective buyers, usually prefers to cultivate architects.

"An architect," Dodson notes, "is among the first to know that someone is planning to build a new home. If we can get to him first and help him design the air conditioning into the house in the blueprint stage, he frequently will recommend our equipment to his client.

"It's sometimes the case that a builder or house buyer is pretty cost-conscious. And one of the first casualties of the corner-cutting is air conditioning.

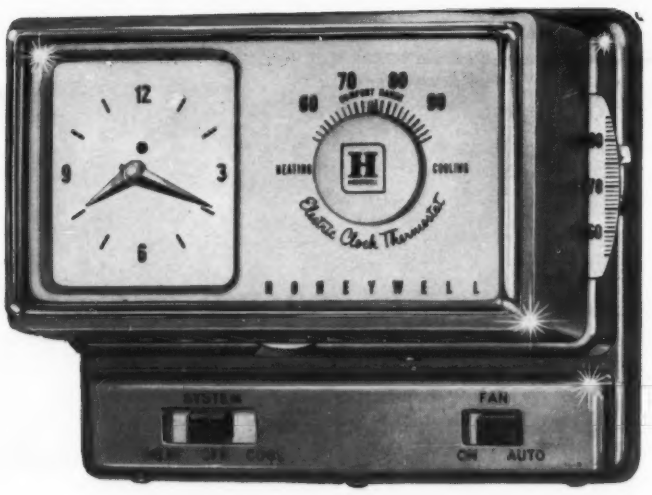
Dodson's policy when calling on prospects is to give them a firm bid in 15 minutes. "I take my catalogs along and write out a complete breakdown of all our costs and markup. We feel that such straightforwardness creates confidence.

"Of course," he adds wryly, "occasionally I have to go out on a limb and gamble on costs on a job.

"For instance, I may have to estimate the labor involved in putting in a relatively complicated condensate drain setup in an existing home and could be

Pave the way for future business!

INSTALL HONEYWELL HEATING—ON EVERY



T861 Heating-Cooling Thermostat with Q426 sub-base. World's finest electric clock heating-cooling thermostat. Automatically turns heating or cooling up or down in the morning, again at night. This is the answer for customers who want the ultimate in year-round comfort, convenience and economical operation.

These thermostats are a constant reminder to your customers that they can easily convert later to year-round air conditioning

Naturally you're going to sell complete year-around air conditioning whenever possible. But for those who can't afford year-round air conditioning right away, one of these Honeywell Heating-Cooling Thermostats offers definite advantages. Point out to your customers how easily they can convert—at a later date—to year-round air conditioning. And with the thermostat already properly installed, for both heating *and* air conditioning, your future installation is easier, too.

You benefit many ways when you handle these dual-purpose Honeywell heating-cooling thermostats. You have easier installation, simplified inventories, a training school for your crew—*plus* really fast help when you need it. Honeywell backs up all its products with prompt, efficient, nation-wide service—instantly available from any one of Honeywell's 112 sales-service offices. There's one near you.

For information about Honeywell's complete line of control systems for heating and cooling, call your nearest Honeywell office. Or write: Minneapolis-Honeywell, Dept. AN-7-94, Minneapolis 8, Minn.

Honeywell

First in Control

too low. But in the long run, we usually come out all right."

Another Dodson & Cochran policy is to size and "vapor-seal" the ductwork and make provisions for condensate drains on all heating jobs, to make them readily adaptable for cooling later on. The firm has been making growing use of fiber "Sono-air-ducts" in slab-floor houses.

During fiscal 1959, the firm's first year as an Arkla dealer, salesman Dodson found the gas equipment a welcome addition to his line. "The Arkla installations accounted for approximately a fourth of total sales the first year," Dodson relates. We took on the line for several reasons. First the Sun Valley is more competitively priced than ever before. It's also a smaller, more compact package.

"Another advantage, of course, is that the Sun Valley gas unit is something comparatively new to this area. Most of the buyers had heard about gas air conditioning and specified it as their preference.

"Much of this stems from the carry-over advertising benefits we receive from nearby utilities, who promote the equipment over radio and TV, in newspapers and other media."

Dodson and Cochran's success in breaking into a new contracting market (fiscal 1959 volume: $400,000, vs. $364,000 in 1958 and $284,000 in 1957) is matched by their business acumen.

"We're at the point right now," notes Dodson, "where we want to do everything we can to reduce operating expenses on the same volume."

One cost-cutting route the firm intends to take is to streamline its back shop. At present, the 4,000-sq. ft. shop chiefly houses sheet metal supplies and bending and cutting equipment and a small amount of storage space for units.

In a separate building in back is pipe storage, and air conditioning units are stocked in a larger warehouse several blocks away. The company tentatively plans to erect a new 6,000-sq. ft. building where it can do most of these activities under one roof. "We need more of an assembly-line operation," Cochran points out. "For instance, with the present arrangement, about twice a month it takes two men around a half-day to carry about 6,000 lbs. of sheet metal from our loading dock in back to storage racks at the opposite side of the shop.

"In the new building, we plan to put storage bins right at the loading door and try to arrange it so we can load sheets through the back side and pull them out as we need them from the front. That one change should save us a lot of man-hours and money, with out cost running from $4 to $5 per man-hour.

COCHRAN, left, checks over the tin work on a job with Leonard Crowder, sheet metal shop foreman, as Fred Straires works at a nearby table.

COCHRAN and Dodson discuss the engineering and layout of a large-tonnage air conditioning installation.

Will Watch Purchasing More Closely In Future

"Another way we plan to reduce overhead is to keep closer tab on our purchasing. For example, we'll watch more closely how many sheets of each gauge and width of sheet metal we use in a year.

"Frequently, when we need lengths of, say, 48-in. square duct, we may have to piece two 30-in.-wide pieces together, leaving 12 in. of waste, instead of using two 24-in. pieces with no waste."

The firm keeps running stock of such things as reducers, ceiling diffuser boxes, elbows, floor and diffuser boots.

"In other words," Cochran goes on, "we believe the best avenue to follow in the immediate future is to cut our operating costs on the same total volume of business by eliminating waste and unnecessary motion. The aim is to reduce the break-even point from, say, $250,000 to $200,000 a year."

Though business spurts during the summer, Dodson says the company still stays sufficiently busy in the winter.

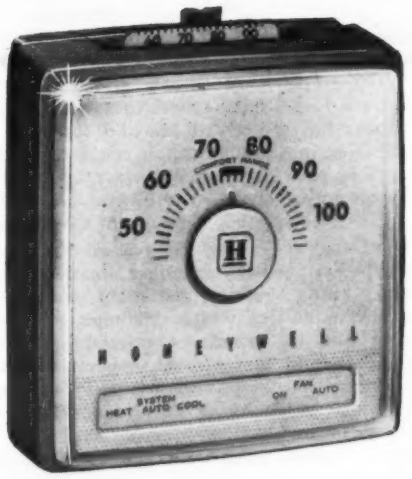
For instance, this coming fall and winter Dodson & Cochran will make several large-tonnage commercial installations. These will include 28½ tons in a bank (an Arkla-Servel 25-ton water chiller and a 3½-ton Model 500 Sun Valley), 40 tons (electric) in a recreational building, and 70 tons (60 electric and 10 gas) in a church.

Like some other contractors, the concern does not actively solicit service business.

Reason: There's too little profit in it. Cochran cites this example:

"Suppose a man produces 32 hours worth of billable service business in a given week. At $6 an hour charged, that's $192. Our total cost of having him on the payroll for 40 hours at, say, $4.50 an hour is $180—theoretically a $12 profit." Included in each purchase price is a "service reserve" amounting to roughly 2% of the total cost of the job.

COOLING THERMOSTATS HEATING INSTALLATION!



T870 Heating-Cooling Thermostat. This new deluxe heating-cooling thermostat gives the convenience and economy of completely automatic changeover between heating and cooling. Six models, seven sub-bases give up to 42 control combinations. Easy installation. Dust-free mercury switches. Handsome styling.

T87 Heating-Cooling Thermostat. Standard residential heating-cooling thermostat. Gives semi-automatic changeover between heating and cooling. 12 matching Q405 sub-bases provide the most flexible control combinations available. Features the world's most popular styling, with decorator cover, dust-free mercury switch.

IDEA: Hang one of these free cards on each thermostat installation!

It quickly explains to your customer the advantages of having a heating-cooling thermostat on their "heating only" installation. Sells customer on ease of converting later to year-round air conditioning. Provides a place for your name and address, so they call *you* for their needs.

MAIL COUPON FOR FREE THERMOSTAT HANGER CARDS

MINNEAPOLIS-HONEYWELL
Department AN-7-94
Minneapolis 8, Minnesota

Please Send Me ☐ 10 ☐ 25 ☐ 50 free thermostat hanger cards.

*Firm Name*_____

*Your Name*_____ *Title*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

They'll Do It Every Time

by

Jimmy Hatlo

BIG DEAL—THE OTHER GUY CATCHES THE BAD NEWS AND SLYPANTS LEAVES ALL OF A TWO-BIT TIP....
THE GUY PICKING UP THE TAB HAD THE TEN-BIT SPECIAL AND JOE TIP PUT AWAY A SIRLOIN COW....
NO-NO... I'VE GOT IT! THIS IS ON ME...
OH, WELL--OKAY-- I'LL LEAVE THE TIP!
ALSO WATCH SLYPANTS LET THE FALL GUY GET TO THE CHECKROOM FIRST TO PAY THE BEANY AND BENNY RANSOM...
I CAN SPOT 'EM... HE'S A TIP HIDER... PUTS FIFTEEN CENTS UNDER THE SAUCER AN' DUCKS WHEN THE WAITER AIN'T LOOKING...
LOWER MATHEMATICS-- WATCHING THE FREE-LIFTER SPLIT THE EXPENSES HIS WAY....
THANX AND A TIP OF THE HATLO HAT TO EDDIE GERMANO 91 PINE HILL RD., DEDHAM, MASS.
JIMMY HATLO 12-25
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Another Reason for the High Cost of Living

FEATHERBEDDERS are robbing American consumers of billions of dollars every year. Moreover, they are inflicting inflationary penalties on the widow, the pensioner, old folks living on fixed incomes —along with wage earners like you and Joe and everybody else.

No-work, make-work, and slow-down tactics which flourish under the monopoly power of politically sheltered labor unions constitute a serious national problem. All of us are paying for empty hot air.

Featherbedding detracts from the dignity of the individual, and degrades our national character. It lowers productivity, runs up costs and prices, contributes directly to inflation, cheapens the value of the dollar.

A home buyer is saddled with the extravagant cost of plumbers who refuse to work on new homes which don't require cast iron sewer drains and pipes; by carpenters who refuse to handle prefabricated doors and pre-assembled windows; and by painters who refuse to use sprayers or rollers.

A grim example: the railroad industry alone is forced to pay $500 million a year for work *not done* by free-ride employes.

Add to this monstrosity those featherbedding costs in all other transportation fields, in the building trades, in printing and publishing, in stretch-the-work practices in many other industries . . . and you can see that the senseless waste easily runs into billions of dollars in terms of taxes and higher prices.

Latest study of railroad costs reveals that featherbedding adds at least 5% to all shipping and travel prices. Here's where the money goes: Full pay for firemen with no fires to tend; for brakemen with no brakes to handle . . . eight different engine crews required on a 16½-hour run between Chicago and Denver.

An engineer on the New York-Washington run (about four hours) collects more than twice a basic day's pay and, after a few hour's lay-over, makes the return trip and collects 4½ basic day's pay for eight hours of work in a 14-hour time spread.

A switch engine foreman who spends maybe 10 minutes tilting a lever for a passenger train may get an extra day's pay at yard rates.

In one typical case, a maintenance-of-way engineer and fireman were paid to operate a steam-ditcher on a yard trace. An engine-service engineer and fireman also had to be paid for *not* operating the steam-ditcher. They just sat by and watched.

One day the maintenance-of-way fireman didn't show up. The engine-service fireman had to leave his soapbox and do the actual firing. *For this he received an extra day's pay for working in addition to his regular pay for not working*—all in the same day.

These examples compiled by the Association of American Railroads are typical of the practices found in other industries, particularly the construction field.

The no-work, make-work, and less-work activities of that business caused the president of a midwestern electrical workers' union to remark: "Some projects are more like a convalescent home than a construction job."

This official arranged to have members of his local attend a course at the University of Kansas to study the ill effects of loafing. He once estimated that a new home may cost up to 25% more than it would if all workers on the job put forth their best efforts.

Union spokesmen declare (but not under oath) that there are no union-sanctioned restrictions on the output of bricklayers.

However, productivity surveys disclose that the slow-motion tactics of bricklayers constitute one of the most common problems in the building trades industry. A recent study indicated that in Chicago "coffee breaks" were reducing bricklayer efficiency by 60%.

Featherbedding robs the consumer. It inflicts inflationary penalties on aged pensioners, teachers, soldiers, and all others living on fixed incomes—plus all who have insurance policies and savings accounts.

An effective Federal law against these practices would do much to ease inflationary pressures. It would also:

Lower the cost of living—yours and mine.

Write your Congressman!

Misunderstood Wife: The lady who phoned her husband and asked him to bring home a quart of lacquer.

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F. M. COCKRELL, *Founder*

'The Conscience of the Industry'

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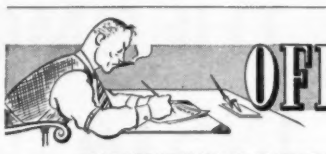

OFF THE CHEST

QUESTIONS FIGURES IN $200,000 BUDGET

Butler Heating Co.
Dayton 3, Ohio

Editor:

I have noted with much interest the article in the March 16th issue of your paper concerning the suggested budget for an approximate $200,000 a year business put out by the Heating and Air Conditioning Research and Development Association of Raleigh, N. C.

First, I would like to say I think a study of this type is one of the most beneficial things that can be done for our industry. However, I would like to suggest a few refinements and take issue with the budget itself not in a critical sense but in the hope that through discussion and exchange of ideas we may all better ourselves.

I believe a study of this type should be done in dollar and cent figures rather than percentages. It would more clearly indicate the amount of money allocated to each expense account and would enable the student to more easily compare it with his own operation. Furthermore, I think a study of this type could and should be broadened by obtaining profit and loss statements from around the nation on a strictly anonymous basis, publish one each month, and let the Association and the nation at large analyze it and present comments which could be published and make very interesting reading. I would certainly lend by support to such a venture.

Now in regard to the suggested budget itself, I am concerned with the man who is running a business of this type. A man who is doing $200,000 worth of business with out sales help (no commissions shown), without any supervisory labor (all productive), with a minimum of advertising ($1,200.00 — hardly more than Yellow page listings). This is a real busy man and a most ideal situation if it can be done —but it just doesn't sound feasible to me for the general run of business. I think, perhaps, the whole secret is the nature of the business itself. Is the contractor engaged in large

(Concluded on next page)

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Name.....
Company.....
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City..... Zone..... State.....
IMPORTANT: Company's Type of Business.....

(Concluded from preceding page)

new construction projects, residential new house market, residential old house market, or a combination of all?

I enjoy reading your paper and urge a continuation of this type of study.

R. L. BUTLER

WHY NOT DATA ON MAGNETIC CLUTCHES?

Truck & Trailer Refn. Service
Elizabeth, N. J.

Editor:

I have your Vol. I and Vol. II booklets concerning Auto air conditioning which are very helpful, but you have omitted one of their most important components, which is the Magnetic Clutch. Don't you think it would be more complete if you included this component in these booklets? They are Borg-Warner and Eaton.

If you have any pamphlets regarding this suggestions I would like to have them.

WILLIAM COLLINS

* * *

Answer: We have not omitted mention of that very important component—the magnetic clutch—in the first two manuals or in Vols. 3 and 4, but we admittedly have not given any detailed service data on the clutch or any other component, such as compressor, etc.

This policy has been followed purposely and for several reasons.

Space available for this material is limited, both in the weekly issue of AIR CONDITIONING, HEATING & REFRIGERATION NEWS and the manuals. We have chosen, therefore, to discuss the systems of as many makes and models as possible rather than to go into details of servicing the various components. A serviceman, we feel, should know exactly how a system is supposed to work before he attempts to diagnose the cause of the trouble.

FIRM HAS SOME MODELS TO SELL TO SCHOOLS

Company Name Withheld
Upon Request

Editor:

First, I want to say that I enjoyed thoroughly the "Report on Education" which appeared in the NEWS last year. I think you did a very fine job on what I believe to be an important subject.

Secondly, along the lines of education there is a possible way in which you can help us in trying to be helpful in the industry. As you know we have working models of cooling equipment in our factory schools. As these units become obsolete they are replaced with new models. Hence, from time to time, we have cooling equipment to be disposed of in some manner. The equipment does not carry new product warranty and so we do not want it to go into service on comfort cooling.

I recall that in one of your articles you covered the matter of the difficulty of trade schools obtaining equipment from manufacturers. In discussing this matter, it has occurred to us that this equipment should still have value for training purposes in such schools.

Is it possible for you to suggest a list of trade schools which we might contact to see if they would be interested in this equipment?

L.K.H.

'ANNUAL STEAL' EDITORIAL WAS FOOD FOR THOUGHT

M & V Supply Co., Inc.
Oklahoma City, Okla.

Editor:

Read with much interest your editorial on "The Annual Steal," and want to compliment you on the thought, put into the article, as well as your fortitude in expressing, in writing, your views.

It would be very heartening if this article could appear in our larger dailies, particularly in the industrial areas producing steel, It is, of course, food for thought to any one in this day of spiraling inflation.

Also, am very, very much in accord with your statement, on the monopolistic bosses, and it is my contention that any one drunk with *power* or *self-importance,* can be far more dangerous than someone drunk from beverages.

Wish there were more editors that would come out and print their views, as you have, and am sure there are thousands of employers as well as employes, that share your sentiments.

A. R. MORIN

'IT TOOK GUTS' TO WRITE SERVICE EDITORIAL

Refrigeration Service
Engineers Society
1724 E. Lake Bluff Blvd.
Milwaukee 11, Wis.

Editor:

It was with great interest that I read your Techcenter Editorial "About Servicemen."

Never before have I seen the problem so well defined. If only the solution could be perfected as well.

This opposition to change is an enigma which has affected refrigeration service people for some time. The unfortunate thing, as you mention, is that young men coming into the field are affected by this feeling.

The RSES has been aware of this shortcoming and, as you know, is conducting a constant campaign aimed at upgrading service personnel and work.

I would like to hear some of the reactions to your article. I know it took guts to write it, and there are bound to be strong repercussions on both sides.

RALPH F. JANSEN,
Asst. Educational Director

* * *

General Electric Co.
Tyler, Texas

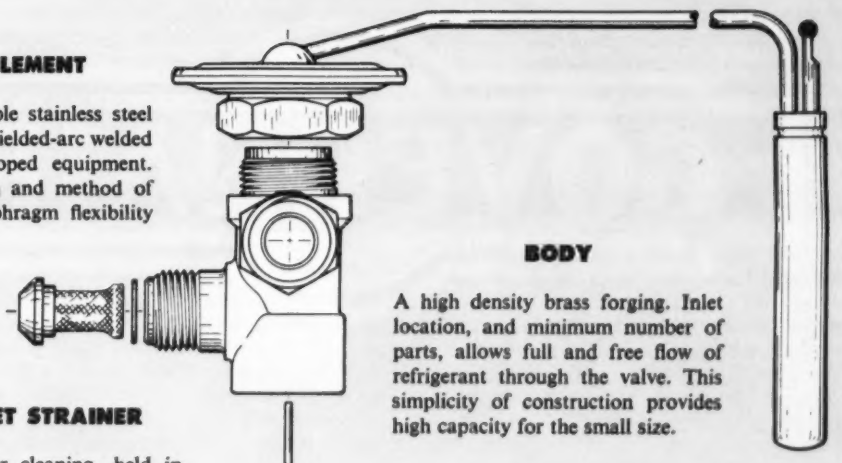
Editor:

You are to be congratulated on your Techcenter Editorial "About Servicemen" published in the June 1 issue of the NEWS.

Since most of the remarks in your editorial coincide with many statements that we made during our "School for Customer Satisfaction," we would like your permission to reprint this editorial so that we can distribute it to the servicemen in our dealer organizations.

J. S. MATACHINSKAS,
Manager
Technical Information & Training
Air Conditioning Dept.

DETROIT Expansion Valves Last Longer · Operate Smoother



POWER ELEMENT

The small removable stainless steel power element is shielded-arc welded by specially developed equipment. In this new design and method of assembly, full diaphragm flexibility is accomplished.

BODY

A high density brass forging. Inlet location, and minimum number of parts, allows full and free flow of refrigerant through the valve. This simplicity of construction provides high capacity for the small size.

LARGE INLET STRAINER

Easily removed for cleaning—held in position by a retainer clip.

BALL NEEDLE AND PUSH ROD

Self aligning and self centering—seats perfectly every time. Ball is concentric to push rod.

ONLY THREE MOVING PARTS

—for smoother operation and longer life. No clips, extra springs or miscellaneous parts. Detroit valves are easily disassembled for inspection and cleaning. Ready availability of parts makes field service possible when needed. Special tools are not required.

The Detroit 718 is just 2¼" high. When the valve is installed as shown here, inlet is at bottom and outlet is to the side. This allows easy replacement of most valves without repiping.

COMPACT CAPACITY

Detroit's COMPACT CAPACITY line provides streamlined valves to meet most refrigeration and air conditioning requirements. The line provides the smallest valves per ton of refrigeration, designed to be used for original equipment installations and for replacement. They replace bulky, old-style valves—providing as much capacity—and can be installed without repiping. *See the COMPACT CAPACITY line at your Detroit Wholesalers.* Ask him, too, to show you the new valves with built-in inspection windows. Do it—today!

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AMERICAN-Standard
DETROIT CONTROLS DIVISION

Selling Service Contracts

Informed Customers Prove To Be Bulwark of Thriving Maintenance Contract Business, Contractor Believes

AUGUSTA, Ga.—As an informed public is the bulwark of democracy, so informed customers are the bulwark of a thriving service business.

Sig Cox, York refrigeration and air conditioning contractor, finds this to be so in selling and sustaining his maintenance service contract business.

Each time one of his servicemen makes a scheduled call, the serviceman fills out a detailed worksheet in duplicate. When finished, he presents the duplicate copy to the customer.

"We find this a very good instrument in selling contracts," asserts G. W. Amerson, service manager. "It gives the customer some idea of the various steps necessary to keep his equipment in top operating condition.

"We also find it very effective in avoiding overlooking some maintenance steps. This cuts down on call backs, and leaves the customer with a much better impression of the importance and effects of maintenance.

"When we sell and install a new job, we then make up an inspection sheet for the number of inspections we plan to do during the 12 months' free warranty period, using the same type inspection sheets as for contract service.

"During this period, the customer receives these inspection sheets just as he would if covered by maintenance contract. When the warranty expires, he is approached on the idea of continuing this maintenance program."

Sig Cox offers the customer two types of contract. One is a complete contract covering both labor and material. The other covers labor, both emergency and scheduled, but no materials. The latter is called an IAO contract (inspection, adjustment, and oil).

"We find that the IAO type contract has proved to be the most practical one from our standpoint and from the customer's," Amerman said. "Cost of a complete contract is usually prohibitive due to the cost of materials."

The IAO contract form is a simple one. It lists the equipment covered and specifies the number of inspections to be performed. The worksheet containing the list of services to be performed is declared a part of the agreement.

The contract contains only two hedges. They are:

"All work is to be performed during our regular working hours. All major repairs, and necessary parts are not included in this agreement.

"In consideration of the nominal charge made for this service we shall not be liable for the operation of the equipment nor for injuries to persons, or damage to property, except those directly due to negligent acts or omissions of our employes, and in no event shall we be liable for consequential damages. We shall not be held liable for expense incurred in removing, replacing, or refinishing any part of the building structure necessary to the execution of this agreement or for any losses due to spoilage."

The services covered, of course, vary with different types of equipment. Below are reproduced the specific work steps taken from several contract worksheets:

GENERAL
AIR CONDITIONING

AIR CONDITIONING UNIT OR SYSTEM

- Clean or replace air filters
- Check all belts, adjust or replace as necessary
- Oil or grease all fan motors and bearings
- Check pulley alignment and tighten set screws
- Clean entire unit and coil—use brush, air blast, or steam as necessary
- Clean drain pan and drain connections as necessary
- Check unit for vibration, tubing rubbing, etc.
- Check fusible plug for evidence of refrigerant leaks
- Check water valve for tight closure. temp. off ..... on .....
- Tighten all electrical connections and check for burned contacts
- Report below the amp reading of all motors and job voltage
- Refrigerant temperature at evaporator—off ..... on .....
- Check atmostat operation and invert solenoid if necessary

COOLING TOWER OR EVAPORATIVE CONDENSER

- Drain, flush, and refill basin.
- Lubricate bearings on all fans, motors, and pumps
- Adjust belts—check pulley alignment and tighten set screws
- Circulate condenser cleaner—see maintenance manual
- Clean and remove rust—paint tower and exposed equipment as necessary
- Check float valve for calibration and tight closure

HEATING SYSTEM

- Vacuum clean heat exchanger and smoke pipe as necessary
- Check and adjust over-fire draft. Reading .....
- Check and adjust draft regulator for proper CO_2 reading .....
- Clean helix on primary control—Check position and timing
- Replace nozzle — check position of electrodes—clean and adjust
- Clean oil strainers—replace oil filters
- Remove and clean and adjust pilot assembly
- Lubricate oil burner, HW circulator and other special motors
- Final CO_2 reading ..... stack temperature .....
- Winterize system
- Summerize system

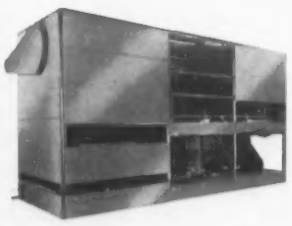
COMMERCIAL
REFRIGERATION

- Oil all sleeve bearings
- Grease all ball bearings
- Adjust or replace belts as necessary
- Tighten all pulley set screws and fan cap screws
- Check oil level in all compressors and add as necessary

CITIES SERVICE OIL COMPANY — ROMA WINE COMPANY — ALLEN B. DUMONT LABORATORIES, INC. — AMERICAN AIRLINES, INC. — GENERAL SERVICES ADMINISTRATION — J. M. FIELDS STORES — U. S. ARMY — FROZEN RITE, INC. — PACIFIC TELEPHONE & TELEGRAPH COMPANY — TEXAS FASTENER CORPORATION — RONEY PLAZA HOTEL — UNIVERSITY OF SOUTHERN CALIFORNIA — PHILLIPS PETROLEUM COMPANY — CHICAGO BRIDGE & IRON — GENERAL ELECTRIC — ATLANTIC & PACIFIC TEA COMPANY — ROBERT HALL CLOTHIERS — HUMBLE OIL COMPANY — OLIN MATHEISON — LOCKHEED AIRCRAFT AREOJET — SYLVANIA ELECTRIC — F. W. WOOLWORTH COMPANY — KAISER ENGINEERING CORPORATION — U.S. NAVY SAFEWAY STORES — CONVAIR — ATOMIC ENERGY COMMISSION — CONTINENTAL BAKING COMPANY — REPUBLIC AVIATION — FOOD FAIR STORES — NATIONAL CASH REGISTER — BURROUGHS CORPORATION — FEDERAL HOUSING ADMINISTRATION — EDISON COMPANY — RAND McNALLY & COMPANY — MINNESOTA MINING & MANUFACTURING BANK OF AMERICA — U.S. AIR FORCE — NEW YORK ... COMPANY — FRANKLIN STORES — NATIONAL FOOD STORES — CENTRAL CASUALTY INSURANCE COMPANY ... COMPANY — PACIFIC GAS & ELECTRIC — RADIO CORPORATION OF A ... KY LAGER BREWING GENERAL ... STORES SEARS & ... — STATE FARM INS... - MUZAK CORPORAT... PORATION BOND STO... NSURANCE COMPANY ... REFINING COMPANY ... COMPANY NEW ENGLAND TELEP ... LONIAL STORES, INC. GLENN MANUFACTURING COMPANY — CURTIS WRI... EL MUNDO, INC. — U. S. PLYWOOD — FORD MOTOR COMPANY OF CANADA, LTD. — DIPLOMAT HOT... ILD CAMERA & INSTRUMENT COMPANY — AMERICAN THERMOS PRODUCTS — PACIFIC MURPHY MANUFACTURING CORPORATION — THE MAYTAG COMPANY — INTERNATIONAL BUSINESS MACHINES — NATIONAL BISCUIT COMPANY — ASIATIC PETROLEUM CORPORATION — INSULAR CHEMICAL COMPANY STANDARD LIFE & ACCIDENT COMPANY — EASTMAN KODAK COMPANY — UNIVERSITY OF OKLAHOMA — BELL AIRCRAFT MONARCH METALS WEATHERSTRIP COMPANY — McDONNELL AIRCRAFT CORPORATION — BETHLEHEM STEEL COMPANY — B-THRIFTY STORES, INC. — WAYNE PUMP COMPANY — ARMA CORPORATION — THREAD, INC. — AMERICAN OIL COMPANY TRANSCON FREIGHT LINES — AMERICAN CAN COMPANY — KANSAS CITY FIRE AND MARINE INSURANCE COMPANY — T G & Y STORES — BRITISH OVERSEAS AIRWAYS CORPORATION — RAND McNALLY & COMPANY — NEW YORK TELEPHONE COMPANY WESTERN ELECTRIC COMANY — AMERICAN MACHINE & FOUNDRY — W. T. GRANT COMPANY — PIGGLY-WIGGLY FOOD STORES J. C. PENNEY COMPANY — PENN FRUIT STORES — RUTGERS UNIVERSITY — U. S. MARINE CORPS — HOWARD JOHNSON'S KROGER COMPANY — CIVIL AERONAUTICS ADMINISTRATION — E. I. DuPONT De NEMOURS & COMPANY — SAHARA HOTEL

GOVERNAIR

GOVERNAIR PRODUCTS ARE NOW IN USE BY THESE DISTINGUISHED ORGANIZATIONS



Model SCMZ

Self-contained Multi-Zone air conditioner — one of 18 basic Self Contained equipment models, available from 3 to 120 tons.

Model GMZ

Governair also "Satisfabricates" a complete line of Vertical, Horizontal and Multi-Zone Air Handling Units.

"SATISFABRICATED"©

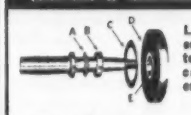
. . . that's the copyrighted term that describes Governair air conditioning . . . equipment which is so basically flexible in design, that it can be manufactured to fit almost *any* space and load requirement.

This beneficial feature, pioneered and developed by Governair, is coupled with imaginative, tested engineering and quality workmanship. The end result is an installation that's a much *wiser* dollar investment.

Write for detailed information, or consult your yellow page directory for the name of our local representative.

THE GOVERNAIR CORPORATION
4840 N. SEWELL • OKLAHOMA CITY

REPLACEMENT
VALVE PLATES & SEALS
for
COMMERCIAL, INDUSTRIAL & AUTOMOTIVE REFRIGERATION
and AIR CONDITIONING
COMPRESSORS
(current & discontinued models)



Long life, high speed, easy-to-apply metal to metal faces. No carbon or other cracking materials.

The only valve plate with replaceable seats.

For the most complete line of replacement valve plates and seals See your Wholesaler, or write for bulletin # 807.

CHICAGO
VALVE PLATE & SEAL
COMPANY
5941 W. FULLERTON AVE.
CHICAGO 39, ILL.

Clean condensers and units, use brush, air blast, or steam as necessary
Paint equipment as necessary
Clean and dress commutators as necessary
Tighten all gasketed connections, flanges, cylinder heads, etc.
Stop vibration, tubing rubbing, etc.
Check for refrigerant shortage and leaks
Condensing pressure ..... Air temperature at condenser ..... off .....
Evaporator temperature in ..... out .....
Running voltage
Report below the rated and running amperage of all motors
Clean compressor house
Tighten electrical connections and check starter points
Clean water-cooled condensers, use acid pump or c.t. pump as necessary

COOLING COILS, FIXTURES, ETC.

Oil and clean blower motors
Clean fan blades and cooling coils, use brush, air blast, or steam
Clean drains and drain pans.
Tighten fan blade and blower wheel set screws
Clean or replace condenser air filters
Tighten flare nuts and expansion valve bulb clamps
Check coil defrosting and adjust time clocks or controls as necessary
Check all lights and starters
Drain, clean, and refill cooling tower or evap condenser
Lubricate all bearings on cooling tower or evap condenser
Protect system against freezing hazards
Check with owner for operating complaints

ICE MAKERS (York Model DER 10 and DER 11)

Drain and refill makeup pan
Add chemical cleaner and circulate 30 minutes, flush thoroughly
Lubricate gear motor bearing, C. B. bearings and compressor motor with Starfax No. 2
Oil drum shaft bearing, sprocket and chain with SAE 20 havoline oil
Check gear box oil level and add 600-W as necessary
Drain and refill gear box with 600-W
Adjust cutter bar to .005, scraper to .010
Adjust chain and belt
Hand sand entire drum area to smooth finish with 200-W W or D
Test system thoroughly for refrigerant leaks

Check for water leaks
Check oil level in compressor and add as necessary
Check refrigerant level in receiver at snifter valve and add as necessary
Check oil pot. Note here if necessary to add oil .....
Check water valve for tight closure
Suction pressure ..... condensing pressure .....
Condenser water temperature on ..... off .....
Running voltage ..... amps compressor motor ..... gear motor .....
Circulate chemical cleaner through condenser water coil, use acid pump
Check unit for vibration, tubing rubbing, etc.
Tighten motor pulley set screws
Tighten all electrical connections and terminals
Check operation of bin thermostat
Check float valve for calibration and tight closure
High pressure cut out point ..... Low pressure .....
Temperature of suction line at drum shaft .....
Check fastening of bin thermostat bulb
Clean entire unit and bin, use brush, air blast, or steam as necessary
Touch up, paint unit and bin as necessary
Capacity test for ½ hour. Lbs ice .... makeup water temperature .....
Check with owner for operating complaints.

Amerman noted that Sig Cox uses various means to advertise maintenance. One means is by direct mail to customers and prospective customers several times a year.

One piece is illustrated by a finger with a string neatly tied around it. Copy reads:

"Timely reminder — repairs and maintenance on refrigeration and air conditioning installations can be kept to a minimum through scheduled maintenance. A stitch in time that saves nine."

Pictured are Sig Cox's building, service truck, repair shop, and parts inventory. A prepaid postal reply card is attached for those who "believe a stitch in time saves nine."

The company also does newspaper advertising.

But most effective, Amerman says, has been the servicemen themselves. "They are sold on the idea and when they find a customer who is not under our plan, they immediately approach him on the idea.

"We find this effective because we can show the customer the difference between the condition of his equipment before we checked and cleaned it and afterwards."

Ohio Wholesaler Moves To Remodeled Building

COLUMBUS, Ohio — A completely remodeled building at 25 E. Goodale St. is the new home of Columbus Automatic Sprayer Co., wholesale distributor of heating and air conditioning controls.

The company, in business since 1931, was formerly located at 348 N. High St.

The new quarters — formerly a warehouse occupied by the Holton Oil Co. — will provide the company with increased storage space, better customer parking facilities, and will enable it to provide more efficient service to customers in Ohio and adjoining states, according to the announcement by the wholesaler.

"Columbus Automatic Sprayer represents practically all major manufacturers of heating and air conditioning controls and carries one of the largest stocks in Ohio," it was pointed out.

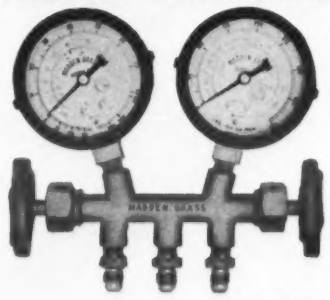
"Besides its local dealer business, it serves customers in a large part of Ohio, Kentucky, and West Virginia by bus or mail.

"It is also designated as a service station for repair of controls."

Denver B. Tracy has been manager of the firm for the past 15 years.

NEW

...FOR EASIER FASTER SERVICING



Pat. Pending

Designed for convenient charging, purging, testing etc., this new compact unit features an all brass forged body, easy-grip hand wheels, Teflon packing and seat for positive shut-off. Equipped with dual scale 2½-inch pressure and compound gauges. Hose connections ¼-inch male flare, gauge connections ⅛-inch female pipe thread.

HANDY HOSE HOLDER

Attaches to back of testing unit so free end of hoses can be conveniently coupled when not in use. Keeps them dry and free from dirt.

SEE YOUR **MADDEN** WHOLESALER

MADDEN BRASS — MADDEN BRASS PRODUCTS COMPANY — AURORA 6, ILLINOIS, U.S.A.

THE PEOPLE WHO KNOW REFRIGERATION BEST

DEPEND ON THE PEOPLE WHO KNOW TUBING BEST!

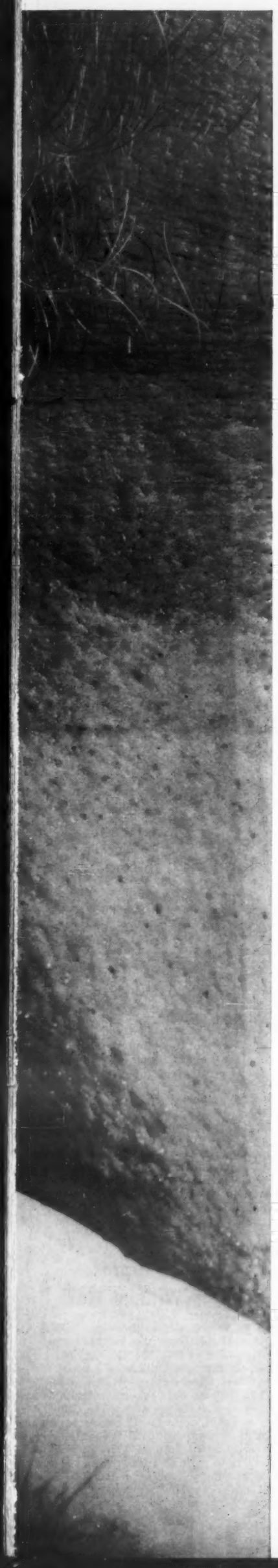
HE'S BENT ON SOLVING YOUR TUBING PROBLEMS!

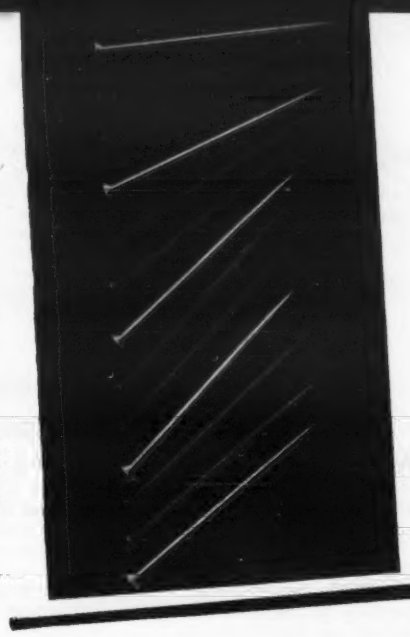
Your tubing's always in perfect shape with Ralph Iorio on the job. He's the Supervisor of Tube Process Engineering for GM Steel Tubing. His job is to find the fastest, most economical way of forming GM Steel Tubing to fit your specifications. Many times he can save you time and money by adapting existing high-speed forming equipment to do the job. Whatever your requirements, you can bet Ralph will find a solution. And you'll be assured of GM Steel Tubing that's quality-controlled to many times your specifications. Put some on test today. You'll see why GM Steel Tubing is ahead in refrigeration sales . . . by miles. *Rochester Products Division of General Motors Corporation, Rochester, New York.*

SEE SWEET'S CATALOG 1a/Ro

GM STEEL TUBING BY ROCHESTER PRODUCTS

AMERICA'S LARGEST MANUFACTURER OF REFRIGERATION TUBING





You're hearing all the noise you'll ever hear from the new WESTINGHOUSE AIR-LINE MOTOR!

Brand-New and Extra Quiet—Westinghouse Air-Line Motors for Air Conditioners

. . . AND FANS . . . AND BLOWERS . . . AND UNIT HEATERS . . . AND—YOU NAME IT!

Here's the new Westinghouse 48-frame capacitor-start or shaded-pole motor—the quietest, most fail-proof motor you've ever had the pleasure of using.

We took away the sound by forcing oil between the nylon washer surfaces. Now they ride noiselessly on oil, not noisily on each other! (It's a Westinghouse exclusive.)

We've eliminated the major source of air conditioner motor failures by soldering and wrapping all electrical connections with multiple windings of insulating tape.

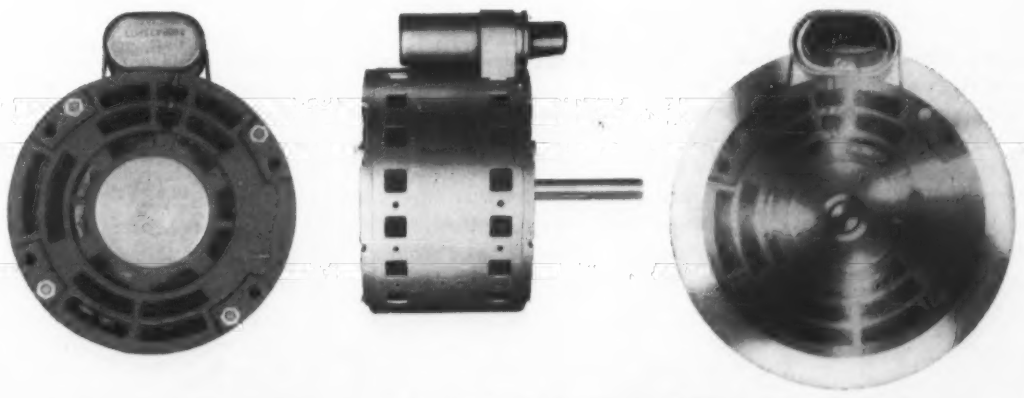
And, of course, the entire motor is designed for superior moisture resistance—with Mylar* insulation, a corrosion-resistant shaft, and double-dipped motor windings.

There's more! . . . perfectly flat endbells and recessed bolts to give you the shortest motor ever; Permawick lubricating system designed for a minimum of five years' lubrication without reoiling; either plug-in terminals or leads, depending on your requirements; and about a dozen other features that your local Westinghouse sales representative will be proud to show you.

Let him demonstrate the new Air-Line motors for you right away. Or write to: Westinghouse Electric Corporation, Mr. C. D. Jakes, Industrial Motor Department, Lima, Ohio.

J-03022

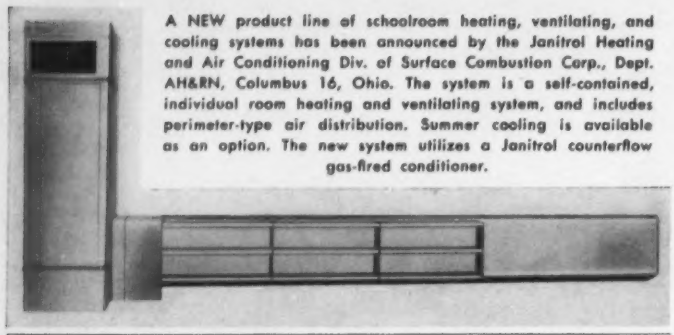
*DuPont Registered Trade-Mark



YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV MONDAYS

Heating, Ventilating, Cooling Systems Bowed



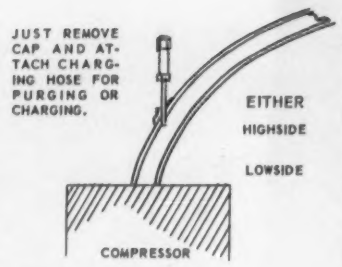
A NEW product line of schoolroom heating, ventilating, and cooling systems has been announced by the Janitrol Heating and Air Conditioning Div. of Surface Combustion Corp., Dept. AH&RN, Columbus 16, Ohio. The system is a self-contained, individual room heating and ventilating system, and includes perimeter-type air distribution. Summer cooling is available as an option. The new system utilizes a Janitrol counterflow gas-fired conditioner.

Offer Permanent Dry-Type Electrostatic Filter

● Development of a permanent, dry-type, electrostatic air filter was announced by Peden Equipment Co., Dept. AH&RN, 4512 Mt. Vernon, Houston, Texas.

Known by the trade name "Filtr-Aire," and made of "Saran"-coated natural hair, these new filters are fire resistant and can be readily cleaned by water washing, according to the manufacturer.

A one-piece aluminum frame with expanded copper-bearing galvanized metal lath holds the filter media in place.



Hi-Lo Introduces Multi-Purpose Valve

● A new service valve said to have many uses is being manufactured by Hi-Lo Valve Co., Dept. AH&RN, P. O. Box 3262, Oklahoma City.

The valve, on which a patent is pending, may be installed on either the high or low side of normal refrigeration systems other than ammonia, according to the company. It may be used on small domestic units, commercial refrigeration, and large and small air conditioning, including automobile air conditioning, and may be installed on any size line, the firm said.

The brass valve is installed by light brazing. The copper stem is inserted in a small hole approximately .125 (⅛ in.) and either hard soldered or sil-phosed to the system.

Diaphragm Pump Aids Scale, Corrosion Control

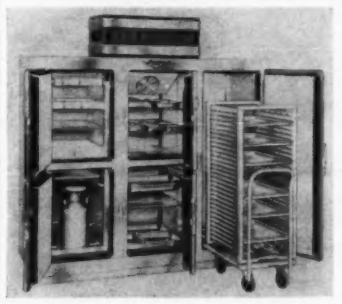
● A new, "low cost" solution feed pump that can be used for chlorinating home well water systems or introducing phosphate or mild alkali treatment to control scale, corrosion, and red water now is available from Calgon Co., Dept. AH&RN, Box 1346, Pittsburgh 30.

Called the No. 77 Solution Feeder, the small electrically operated diaphragm pump has a feed rate adjustable from one pint to three quarts per hour.

Kalamazoo Adds Oil-Fired Furnace

● A new oil-fired unit has been added to its line of winter air conditioners by Kalamazoo Furnace & Appliance Mfg. Co., Dept. AH&RN, 100 Rochester Ave., Kalamazoo, Mich.

It is the OFH 200 Series high boy for small industrial plants, commercial establishments, institutions, and larger homes. Model OH 200 has a rating of 200,000 at the bonnet; OH 225, 225,000 B.t.u.; and the OH 250 is rated at 250,000 at the bonnet. Cold air inlets are indicated at each side of the unit.



'V-Line' Models Made For Bulk Loading

● Its new 1959 "V-Line" models are especially made for bulk loading, storage, and serving, according to Victory Metal Mfg. Corp., Dept. AH&RN, Plymouth Meeting, Pa.

Each is a complete volume food handling system in itself, the company said. They feature interiors that can be changed "in minutes without tools." Interiors are adapted to take pull-out drawers, shelves, meat rails, fractional pans, supports, and portable food racks. All liners, corners, vertical and horizontal bends are rounded to a full ⅝ in. radius, it was stated.

Models come in stainless steel, stainless steel and aluminum, baked white enamel, porcelain, or any combination of these finishes, and are available in normal temperature refrigerators, combination normal temperature and freezer, freezers or warming cabinets.

Phos Sil 6 F Brazes Copper Without Flux

● A new alloy, "Phos-Sil 6 F," is available from American Brazing Alloys Co., Dept. AH&RN, P. O. Box 11, Pelham, N. Y.

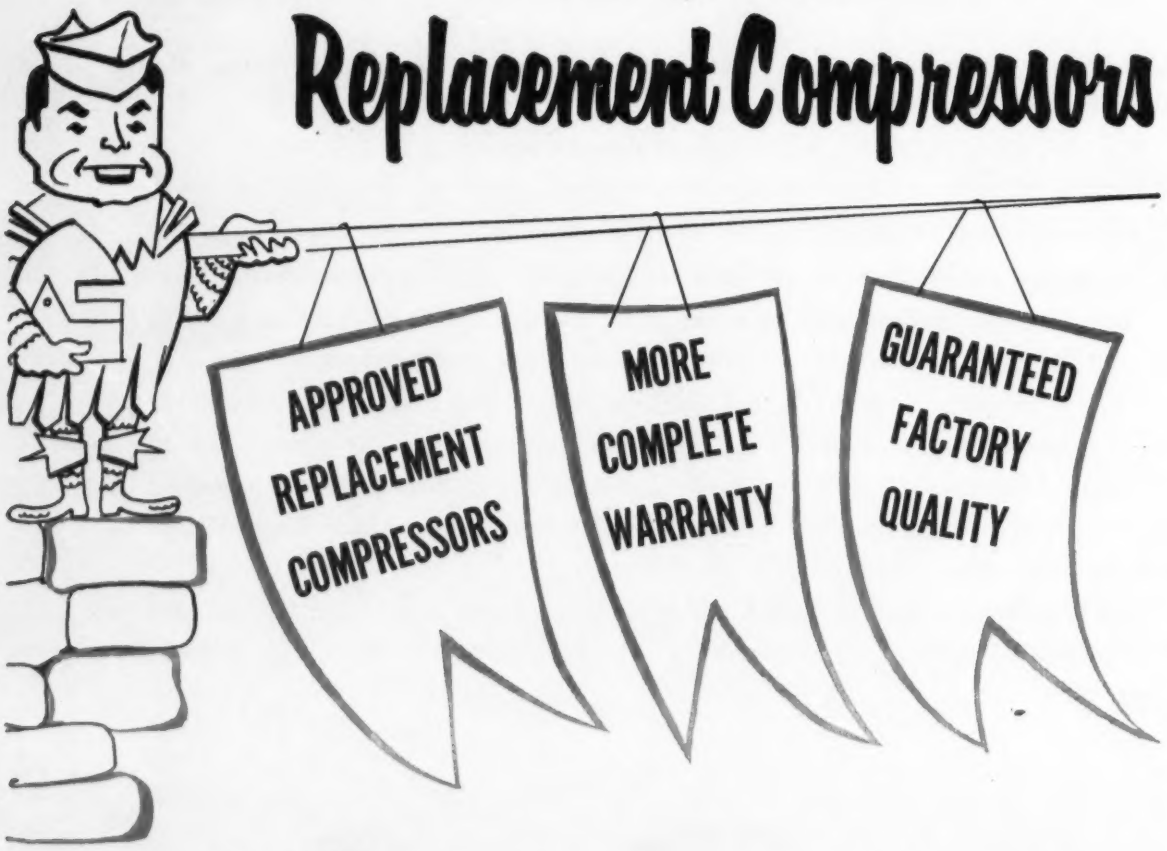
This silver-copper-phosphorous alloy does not require flux on copper and copper alloys, the company said, adding: "It brazes copper at temperatures lower than our Phos Sil 0 alloy. Phos Sil 6 F starts to melt at 1,185° F. and has a brazing range of 1,225° F. to 1,300° F."

No. 6 in a series on better compressor servicing

Herman Hermetic Hints

DON'T BE MISLED ON

Replacement Compressors



Your Tecumseh Wholesaler is your **only** source for approved replacement compressors, more complete warranty, and guaranteed factory quality. What does factory quality mean to you? It means that you get a compressor accurately assembled, properly balanced, completely dehydrated, and specifically designed for the application. This is essential to assure smooth, economical operation. In addition, your replacement compressor will automatically contain all the latest design improvements and electrical parts will accurately match the compressor application. And the Tecumseh New Compressor Warranty, carried on all repair and return compressors, cannot be matched by any rebuilder. See your Tecumseh Wholesaler for approved replacements. You can't do better!

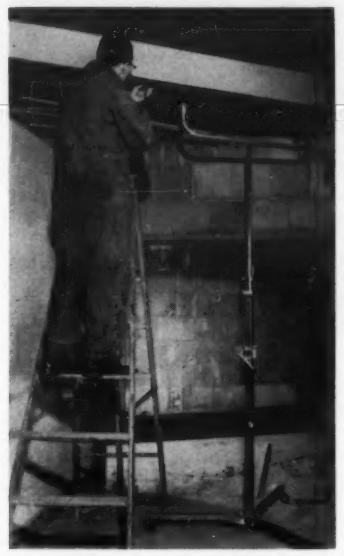
TECUMSEH

The Leader Serving Leaders in the Air Conditioning and Refrigeration Industries

TECUMSEH PRODUCTS COMPANY

MARION, OHIO — TECUMSEH, MICHIGAN

EXPORT DEPT: P. O. Box 2280, 24530 Michigan Ave., W. Dearborn, Michigan
CANADA: Tecumseh Products of Canada Limited, 1667 Dundas St., London, Ontario.



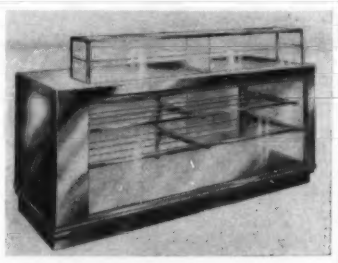
Lantz Improves New Hi-Hoist Lift Model

● A new, improved model of the Lantz "Hi-Hoist" has been introduced by Lantz Mfg. Co., Inc., Dept. AH&RN, Valparaiso, Ind.

Improvements include a new, universal cradle with three sets of adapters that make the unit adaptable to almost any lifting and holding job, according to the company.

The lift mechanism has also been refined to provide easier, smoother hoisting.

The Hi-Hoist is used to lift and hold overhead piping and ductwork in place so that one man can make the installation, it was explained.



Case Designed for Displaying Baked Goods

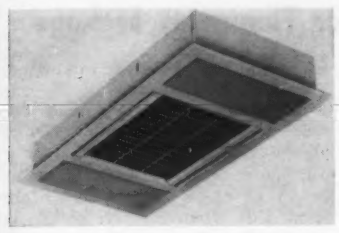
● A refrigerated display case designed especially for protection of baked goods was announced by Arnold J. Heinen Co., Dept. AH&RN, 2618 N. Fourth St., Milwaukee 12.

Built of stainless steel and "Thermopane" plate glass, the case has an air circulating refrigeration unit built into a slim insulated panel on one end, completely enclosed in stainless steel, the company said.

"This permits more usable space in the case interior for product display, while providing a constant 40° temperature throughout the case interior," it was stated. "The interior is designed for unusual flexibility of product arrangement."

Another feature is a stainless steel utility top. Two display shelves on top permit additional non-refrigerated display space, and are recessed to provide space for shoppers' bags and purses. The new case, named the "Frigid 8" is available in standard 7-ft. length and styled to match the new "Kase-Mate" non-refrigerated display case recently announced by Heinen.

More details on the products described on these pages may be obtained by writing the manufacturer at the address given in each story.



Berko Unit Combines Radiant Heating, Lighting

● A recessed ceiling unit combining electric radiant heating with built-in lighting has been announced by Berko Electric Mfg. Corp., Dept. AH&RN, 212-40 Jamaica Ave., Queens Village 28, N. Y.

"Pyrolite," model RCL, is rated at 1,000 watts of radiant heating, with 200 watts of lighting banked on the sides, and is mildly fan-forced. It is available in 120, 208, and 240 v., with either polished chrome or baked white enamel finish.

Kit Contains Needs for Fastening Cases to Masonry

● "Everything a contractor or maintenance man needs to fasten fixtures to any kind of masonry" has been assembled ready for use in a compact $4.95 "All-In-One Contractor's Kit" by The Rawlplug Co., Inc., Dept. AH&RN, 246 Petersville Rd., New Rochelle, N. Y.

The kit contains "Rawlplugs," matching pan-head sheet metal screws, and a Rawl spiral carbide masonry drill.

Kits come in three sizes. No. 8 has 60 #8 Rawlplugs, 60 #8 by 1¼ in. screws, and one $1\frac{1}{64}$ in. drill. No. 10 has 50 #10 by 1 in. Rawlplugs, 50 # 10 by 1¼ in. screws, and one $\frac{3}{16}$ in drill. No. 12 has 40 # 12 by 1 in. Rawlplugs, 40 #12 by 1¼ in. screws, and one ¼ in. drill.

Mobile Man-Lift's Platform Rotates Through 360°

● A new mobile man-lift for overhead maintenance service features a platform which rotates through 360° to right or left.

Collector ring assemblies for the "Vert-A-Lift" are manufactured by B. A. Wesche Electric Co., Cincinnati, for the Lift-A-Loft Co., Dept. AH&RN, Muncie, Ind.

The elevating mast and work platform turn on a ball race bearing in the traveling carriage with power supplied by a reversing geared-motor unit. This mechanism employs Wesche cylindrical-type collector ring assemblies rated at 40 amperes continuous duty.

Device Determines R.h. Of Indoor Atmosphere

● A device to determine relative humidity of indoor atmosphere is available from Newmack Corp., Dept. AH&RN, 147 Eady Ct., Elyria, Ohio.

Called the "Moisture-Lite Indicator," the new device plugs into any electric socket. It incorporates an electronic sensing element which is claimed to give "instantaneous response to changes of moisture in the air."

"Relative humidity is indicated by a tiny electric lamp which glows faintly when relative humidity reaches about 30%," it was explained. "In the dark, the first faint glow of the lamp will appear at about 25% relative humidity. When the moisture content of the air is below 25%, the lamp will go out. A gentle glow indicates an ideal balance of moisture in the atmosphere, ranging from 35% to 50% relative humidity. The glow will gradually increase in intensity as humidity rises."

The New McQuay Radial Unit Cooler—Eight compact aluminum cabinet models ranging from 2,600 to 14,000 Btu/hr at 10° T.D. All have the newly designed hinged aluminum drain pan for easy installation and maintenance.

McQuay
RADIAL UNIT COOLERS
NOW IN ALUMINUM CABINETS

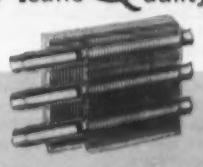
for LONGER LIFE
LIGHTER WEIGHT
BETTER PERFORMANCE

The new line of McQuay aluminum cabinet radial unit coolers is not just the best—it's the very best! You not only get longer life, but aluminum construction means a more attractive appearance and more ease of handling as well. The new hinged drain pan is a standard feature and all McQuay radial unit coolers are supplied with the famous McQuay Ripple-Fin coils which incorporate "Tube within a tube" heat exchangers without additional cost. For the very best radial unit coolers in every way, use McQuay. See the McQuay wholesaler in or near your city, or write McQuay, Inc., 1607 Broadway Street N.E., Minneapolis 13, Minnesota.

McQuay INC.

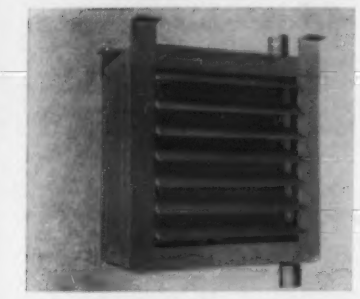
AIR CONDITIONING · HEATING · REFRIGERATION

McQuay Means Quality



McQuay units feature the exclusive Ripple-Fin coils which create maximum turbulence and have wide, full fin collars that act as automatic spacers to form a tube around the coil tube for positive, permanent bond, greatest heat transfer and protection.

Unit Heater Offers Ease of Accessibility



● A horizontal-flow unit heater of improved design that offers ease of accessibility to heater interior while in installed position, has been announced by the L. J. Wing Mfg. Co., Dept. AH&RN, Linden, N. J.

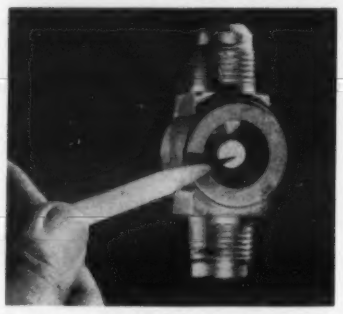
The heater is offered in five sizes: 1, 1½, 2, 2½, and 13. This lightweight, suspended steam unit heater is recommended for garages, offices, stores, and small industrial and commercial applications, where it may be desirable to obtain heat distribution by using one or more heaters.

The two-piece, wrap-around casing can be easily removed for access to the heater section without disturbing steam connections, the company said. The header-tube connection is by a mechanical joint, instead of the conventional welded joint. This permits and simplifies replacement of individual tubes should that be necessary, it was stated.

Foam Tape Serves Many Purposes

● "Foamade" foam tape, a new type of polyurethane self-adhesive tape which weatherproofs, seals, insulates, cushions, absorbs sound and shock, and dampens vibration is being manufactured by Foamade Industries, Dept. AH&RN, 14851 West 11 Mile Rd., Oak Park 37, Mich.

Moisture-Liquid-Indicator Eliminates Leakage



● Its new moisture-liquid-indicator features a fused sight glass which "eliminates all danger of leakage by doing away with gaskets and springs," according to Remco, Inc., Dept. AH&RN, Zelienople, Pa.

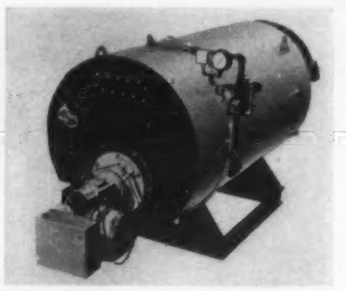
Available for lines ¼ in. o.d. through 2⅛ in. o.d., the device's interior "is given a bright finish for maximum light reflection," the company said. "This permits the most minute bubbles or the slightest change in color of the moisture indicator to be readily detected. This is made possible by the use of a polished all-copper body for sizes ⅞ in. and up and a polished all-brass body for smaller sizes.

"The moisture-sensitive element in all of these Remco indicators turns blue when the refrigerant is dry, and pink when moisture is present. The units are designed so that leaching or discoloration are avoided.

"The fused sight glass is of optical quality and is protected by a cap. On sizes through ⅝ in. this cap is plastic. On larger sizes it is threaded brass with neoprene gasketing."

Want More Details?

ADDITIONAL details on products that are described on these pages may be obtained by writing the manufacturer at the address given in each What's New story.

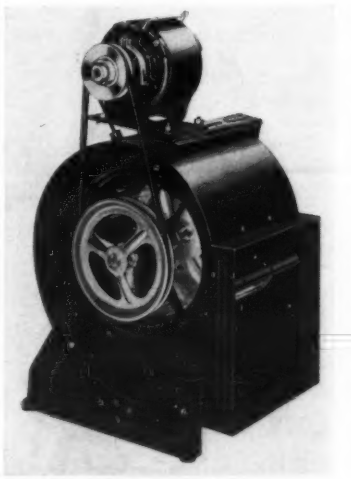


Low-Pressure Generators Bowed

● A new line of packaged scotch-type low-pressure steam and hot water generators was announced by National-U. S. Radiator Corp., Dept. AH&RN, 944 Ash St., Johnstown, Pa.

To be marketed under the brand name, "Bonnie Scot," the new line is available in 20, 30, 40, 50, and 60-hp. models with net ratings ranging from 499,000 to 1,498,000 B.t.u.h.

Designed to meet the demands of a wide range of institutional, commercial, and industrial applications where low pressure heating and/or process steam is required, the units are available for oil, gas, or combination oil-gas firing. Assembled, wired, and tested at the factory, they are shipped ready for immediate operation. Only piping and power connections in the field are required.



'Super-9' Blower Introduced by Viking

● A new Super-9 in. C-Series blower was announced by Viking Air Products, Dept. AH&RN, 5601 Walworth Ave., Cleveland 2.

Designed for residential heating and air conditioning systems, the blowers "will enable manufacturers to up-rate present units without changing cabinet or heat exchanger," the company points out.

The Super-9 is available in three widths, C9-94, C9-71, and C9-60.

According to the manufacturer the Super-9 in. will deliver 1,200 c.f.m. at .8 in. w.g.

Device Changes Circular Recording Charts

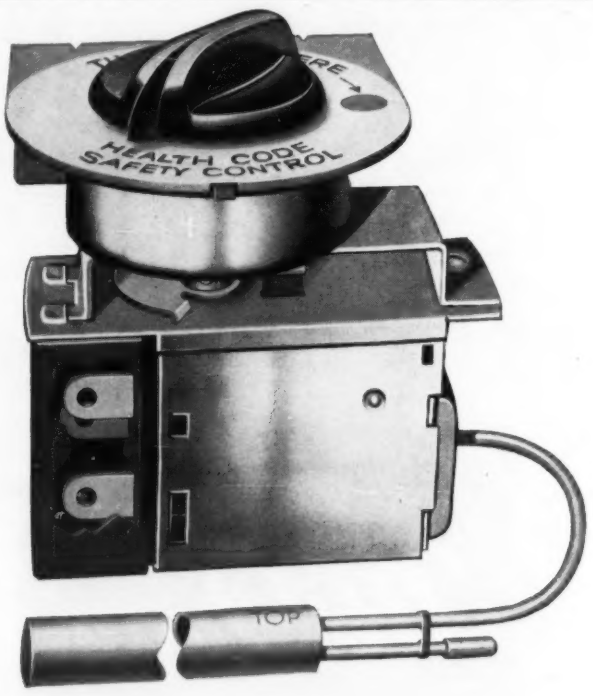
● Availability of a new patented device for automatically changing circular recording charts has been announced by Maeder-Squier Co., Dept. AH&RN, Box 5145, Dallas 22.

Called the "Automatic Meterman," the method affords the utilization of as many as 40 circular charts in a single recorder; disengages the charts, one by one, at virtually any desired time/date frequency; and drops them by gravity into a self-contained storage box, the company said.

NEW HEALTH CODE SAFETY CONTROL

for coin vending machines dispensing cold or hot items

RANCO F11



Recent changes in U. S. Sanitation Ordinance and Code suggest that vending machines with storage compartments for readily perishable food and beverage items be equipped with controls to insure maintenance of temperature *not higher than 50° F.* (cold items) nor lower than 150° F. (hot items). Only exception is a 30-minute recovery period following loading or servicing, after which time the system must have returned and be in normal temperature operation.

Ranco has developed two controls (F11-1000 for cold vending and F11-1200 for hot vending) which automatically prevent machines from vending food or beverages at unsatisfactory temperatures. They are in addition to, and do not interfere with, the regular cycling thermostat required in the machine.

PRESCRIBED SAFETY VALUES

F11-1000 (cold vending): prevents mechanism from dispensing when refrigerated compartment temperature rises to 50° F. or above.

F11-1200 (hot vending): prevents mechanism from dispensing when heated compartment temperature drops to 150° F. or below.

30-MINUTE RECOVERY PERIOD: Both controls have a 34 (±4)-minute time range, non-adjustable.

OPERATION OF THE CONTROL

The F11 Control is a semi-automatic type with manual reset mechanism responding to temperature change and is equipped with a mechanical, spring-wound timer as a component.

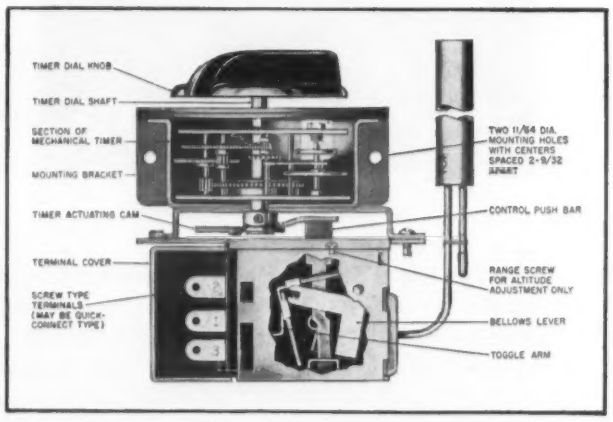
AUTOMATIC FEATURE of the control prevents coin mechanism from dispensing items when temperature of the compartment reaches the prescribed safety setting.

MANUAL FUNCTION is through the mechanical timer (not made by Ranco). Dial knob must be turned to an indicated stop to start the timer after loading or servicing. An actuating cam-push bar mechanism closes the contacts circuited to the machine so it will continue to dispense through the fixed 34-minute recovery period. If the system does not recover to normal operating temperature, the push bar unlatches to prevent dispensing. If the system recovers, the push bar remains latched and dispensing continues.

ALTITUDE ADJUSTMENT: correction provided for elevations to 8000 feet.

ELECTRICAL RATINGS: (Listed with UL and Canadian Standards Association) 115 volts a.c. non-inductive, 2000 watts, 7.4 amps. full load, 45 amps. locked rotor. 230 volts a.c. non-inductive, 1000 watts, 3.7 amps. full load, 23 amps. locked rotor.

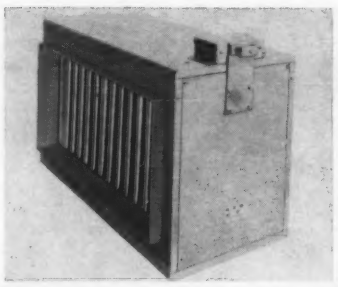
Special modifications are available to meet your product needs through your Ranco distributor.



See your Ranco Distributor or write direct for complete, detailed Bulletin 1726 with wiring diagrams, technical data on F11 Series controls.

Ranco® INCORPORATED
COLUMBUS 1, OHIO

More than 100 million Ranco Controls now in use



Electro-aire Adds 'Low Cost' Cleaner

● Addition of a new "low cost" "Universal Line" model to its line of electronic air cleaners was announced by Electro-air Cleaner Co., Inc., Dept. AH&RN(UL), Olivia and Sproul Sts., McKees Rocks, Pa.

This cleaner is designed specifically for installation in homes which have counter-flow or vertical-up flow furnaces.

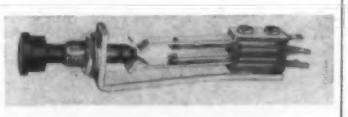
Two Universal Line models with capacities of 800-1,000 c.f.m. and 1,200-1,500 c.f.m. are being manufactured. They are designed for installation with all forced air furnaces from 80,000 to 150,000 B.t.u. input.

Icemaking Machine Employs New Technique

● Introducing of a line of icemaking machines for producing custom-sized ice in large or small quantities was announced by Tippmann Engineering Co., Dept. AH&RN, 3416 E. State St., Fort Wayne, Ind.

The firm offers machines in single and multiple units, with capacities of 1, 3, 5, and 10 tons each per 24-hour period. All units have been designed for use with halogenated refrigerants or ammonia.

"A new ice-making technique is employed, by making ice on multiple plates, which makes the ice remarkably clear, clean, and easy to handle," it was stated. "A sizer is adjustable to produce ice of desired size."



Switches Designed To Save Panel Space

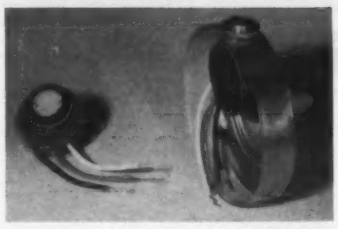
● A new line of locking-type pushbutton switches has been announced by Electrocraft, Inc., Dept. AH&RN, 4432 North Kedzie Ave., Chicago 25.

Designed with the idea of saving panel space, these switches mount easily on ⅝ in. centers, it was stated.

Features include plated steel frame; contact leafs of nickel silver, contacts of fine silver; and pushbutton of molded plastic.

The switches are available in standard 3 ampere rating (ratings may be increased with special materials) and in a wide variety of circuits.

Light Operates Air Conditioning Switch



● "Lightguard," described as a compact and versatile light-operated switch, is being offered by Schacht Electric Co., Dept. AH&RN, 1213 St. Emanuel, Houston 3, Texas.

Starting and stopping of air conditioning systems in offices and plants is listed as one of the device's many applications. Its small dimensions (1¾ in. in diameter) and shape make it suitable for installation in lighting fixture canoplies, outlet boxes, post lanterns, and within magnetic contactors and starter cabinets, the company stated.

Location of the light-sensitive element is variable. It is designed to turn off at approximately one foot-candle and back on at ten. Currently manufactured models are suitable for tungsten loads up to 150 watts on 120 volt a.c. circuits, the firm said.

Alaska Introduces Portable Refrigerator Models

● Introduction of its "Sea Fridge" and "Camper" portable refrigerator models has been announced recently by Alaska Enterprises, Dept. AH&RN, Paterson, N. J.

Both models have a capacity of 1.2 cu. ft., weigh 50 lbs., are 25½ in. high, 20 in. wide, and 16½ in. deep, and have a list price of $139.50. The Camper operates on LP gas; the Sea Fridge, for use on boats, works on 12/110 volt combination.

Marlo Equipment Uses Centralized Lubrication

● A centralized lubrication system which oils all bearings simultaneously in a single operation is now standard, at no extra cost, on all Marlo air conditioning and refrigeration equipment with sleeve-type bearings, according to Marlo Coil Cd., Dept. AH&RN, 7100 S. Grand Blvd., St. Louis 11.

"In the forced-feed system, the single pull of a plunger delivers a measured amount of lubricant from a central reservoir to all bearings at a pressure of 30 p.s.i. "On Marlo units with two or three bearings, a system with 60 cc lubricant reservoir is used—enough for 60 'shots.' On units with four or five bearings, a 150 cc system is used, providing 75 'shots' without refilling."

Taylor-Burch Units Claim Ease, Speed of Installation

● A new line of air-cooled "packaged cooler" units in a variety of capacity ranges and quick-mounting types for all freezing, cooling, and/or ice-holding systems has been announced by Taylor-Burch Refrigeration Products, Inc., Dept. AH&RN, 2524 Brooklyn Rd., Jackson, Mich.

All Taylor-Burch units are completely self-contained. One of their features is the speed and ease of installation on new equipment or as cast-saving replacement units, according to the company.

Once installed, without special tools, their operation is completely automatic including defrosting, it was stated. All models are adaptable to single or multiple unit installation. They are available in side-mount or top-mount models.

Coolerator
CENTRAL SYSTEMS
give you everything needed
for Top Volume Sales
. . . WITH BONUS PROFITS ON EVERY SALE!
Self-Contained Models*
2, 3 and 4 hp sizes
Heat Pump Models
3 ton remote system
Remote
Condenser Sections
3, 4, and 5 ton sizes
Horizontal and Vertical Coil Sections
3, 4 and 5 ton sizes
Blower-Evaporator Coil Sections*
3, 4 and 5 ton sizes
*Decorative fronts optional
● FLEXIBILITY with a unit for virtually every residential and small commercial application!
● EXCLUSIVE SALES APPEAL with the amazing LECTRO-FILTER® an optional accessory for all units!
● EASY INSTALLATION with slide-out chassis and complete, factory-wired controls on self-contained units!
● SERVICE ACCESSIBILITY that makes your job easier, your customers better satisfied!
● NEW LOWER PRICES that are really "hot"! You can close more sales than ever before!
Here's everything you need for high volume, high profit central system sales! And Coolerator gives you the added advantage of its 4-Point Profit Program! Under it you buy direct and make full grosses for better net profits on every sale! It also backs you up with territory protection and a nationwide system of factory authorized service depots. So why miss out on these bonus profits any longer? Mail the coupon below now for complete information.
ONLY COOLERATOR PROVIDES ALL 4 ESSENTIALS FOR BONUS PROFITS!
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Finest in Home Comfort Appliances
COOLERATOR DIVISION, DEPT. CC-7
McGraw-Edison Company, Albion, Michigan
Please send complete information on Coolerator Central Systems and your 4-point Profit Program.
Name
Company
Street
City
State

L & P Occupies Building Designed Just For Distributing Air Conditioning

NEW YORK CITY—A building designed for a single purpose—fast, efficient distribution of air conditioners and air conditioning equipment in volume.

That describes in less than a sentence the new home of The L & P Electric Co., Inc., Fedders distributor in metropolitan New York.

Out of this modern split-level, 87,500-sq. ft. building, L & P is prepared, at one and the same time, to receive trailerloads of equipment, load several trucks for delivery to dealers, store thousands of air conditioners, take in disabled units for service, supply dealers with parts over a counter, and handle all the telephone orders dealers can place through 100 trunk lines manned by three operators.

All this can be done without any one function interfering in any way with the others.

"Years of thought and preparation went into the layout and organization of this building," declared Louis Lidsky, president.

L & P's new home is at 44-22 54th Ave. in Maspeth, across the East River from midtown Manhattan. It occupies a key location off the Long Island Expressway near the Queensboro Bridge, easily approached by expressway from any part of the metropolitan area.

The distributorship moved in at the first of the year, though finishing touches are just now being applied to the structure.

Formerly, L & P operated from headquarters in Brooklyn. However, due to the greatly increased volume of business since their distributorship was initiated in 1948, they were forced to move to larger quarters.

Advantages of the move are already being felt by both L & P and its dealers.

PEOPLE BEHIND AN air conditioning distributorship serving a large metropolitan area. Out front are the top brass: Louis Lidsky, president (l.), and Michael S. Morris, vice president. Directly behind them are their department heads (from l. to r.) comptroller, sales, order, credit, general office, advertising and sales promotion, assistant to vice president, receiving, parts, service, and shipping. At rear are members of these departments.

PRIME FUNCTION — warehousing. L & P now has space in one building to store thousands of air conditioners and offer a complete assortment to fill dealer needs.

Warehousing Consolidated

With its tremendous storage space, L & P has consolidated its warehousing largely to this one location. However, it still maintains auxiliary warehouses in Westchester and Long Island for the convenience of dealers in outlying areas.

In the past, each of the company's six warehouses could not, economically, inventory all models. That meant, at times, dealers had to go to two or more warehouses, miles apart, to fill their requirements. Now, from one central, easily accessible location, they can get any model of equipment they need.

With ample storage space available, the distributor is able to perform his true function and keep on hand an adequate inventory of all models and supplies without fear of running out at times of peak demand.

The warehouse portion of the building is on two levels. Because of the terrain, both the upper and lower shipping and receiving areas are at street level. Each level fronts on a different street. In this way there is no interference between the activities of the two sections of the warehouse.

Service Facilities More Than Doubled

Service facilities have been more than doubled. They are so laid out that dealers can expect to get both in-warranty and out-of-warranty service completed in 24 to 48 hours.

Ample space has been provided to receive, repair, and store units even in peak season. Units are received and placed on rolling steel tables and remain on the tables until the repairs are completed.

Racks are provided in the reception area adjacent to the shipping yard. Some 300 repaired units can be stored there awaiting dealer pickup.

Receiving and shipping doors are at opposite ends of the reception area to facilitate traffic flow.

Shop facilities include five charging stations equipped with special electrical testing boards, steam cleaning booth and steam jenny for cleaning of units, a paint spray booth enclosed in a special fire-proof and dust-proof room, racks to hold a large number of replacement compressors—both large and small.

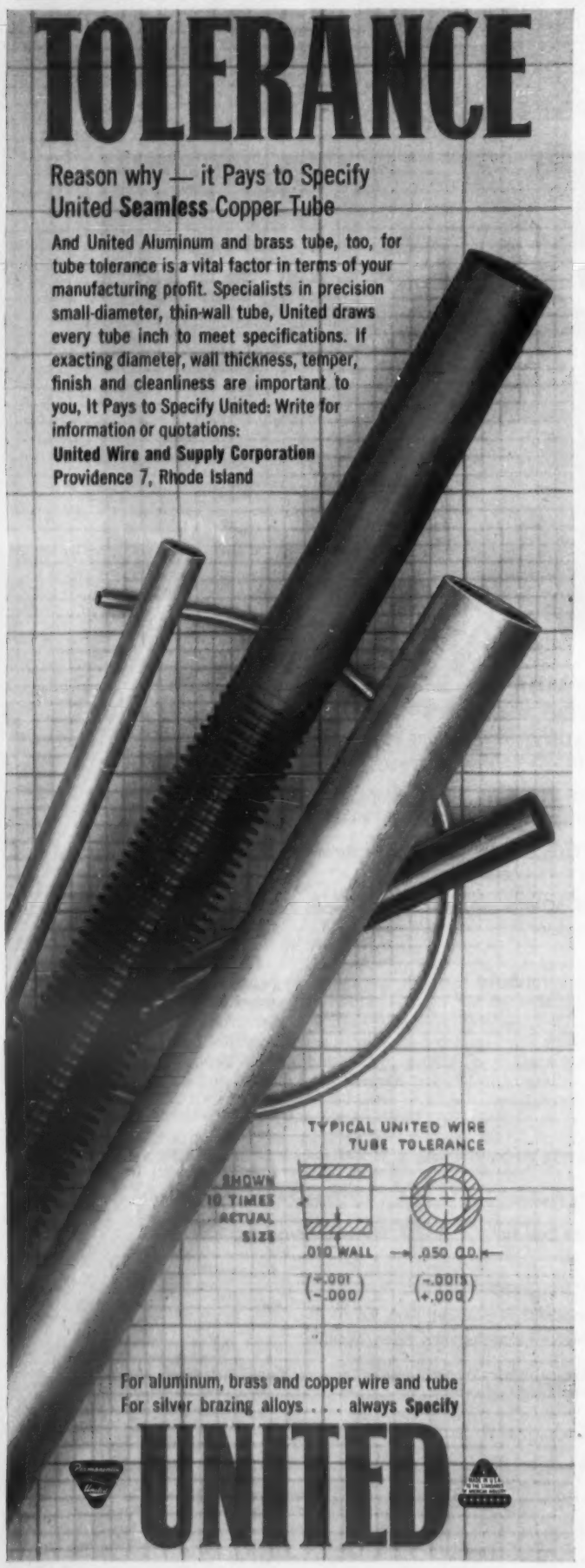
In addition to the staff of servicemen employed in the shop, the service department also maintains outside men who trouble-shoot for dealers with

TOLERANCE

Reason why — it Pays to Specify United Seamless Copper Tube

And United Aluminum and brass tube, too, for tube tolerance is a vital factor in terms of your manufacturing profit. Specialists in precision small-diameter, thin-wall tube, United draws every tube inch to meet specifications. If exacting diameter, wall thickness, temper, finish and cleanliness are important to you, It Pays to Specify United: Write for information or quotations:

United Wire and Supply Corporation
Providence 7, Rhode Island



For aluminum, brass and copper wire and tube
For silver brazing alloys . . . always Specify

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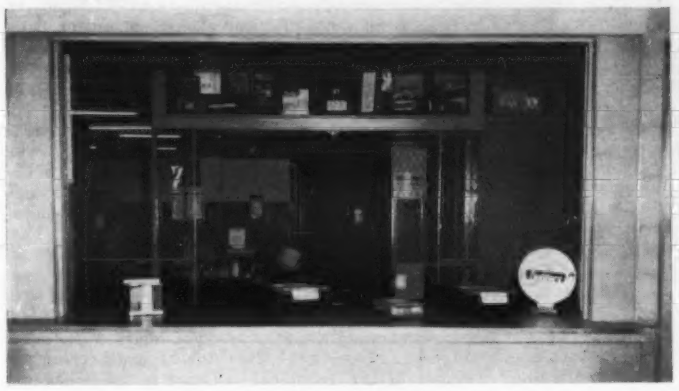
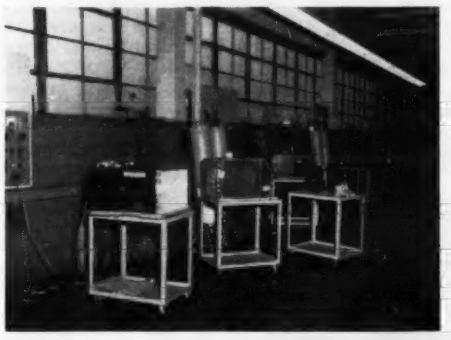


PARTS DEPARTMENT—maintains comprehensive inventory for dealer service departments.

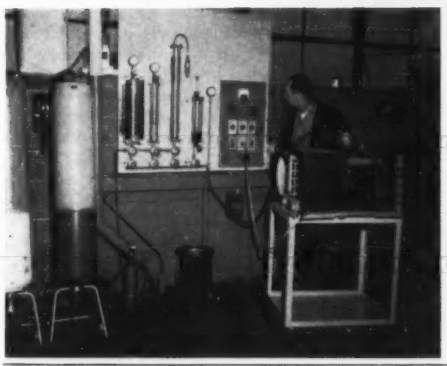
AMPLE RESERVES of exchange compressors are kept in stock, conveniently stacked along one side of the shop.



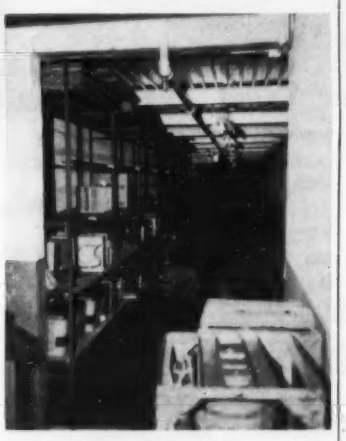
SERVICE DEPARTMENT — provides in and out of warranty service for dealers on 24 or 48-hour basis.

FINAL TOUCH is paint spraying that makes units look like new. Booth is sealed off from rest of shop to keep it fire-proof and dust free.

UNITS BROUGHT IN for repair first get a good steam cleaning.



THEY ARE MOUNTED ON wheeled steel tables for their trip through the shop and visit one of five charging stations with special electrical testing boards.



AWAITING PICK UP by dealers, finished units are put on these racks adjacent to the service yard.

service problems, which they cannot handle themselves.

Between the service department and the warehouse is the parts department, where a comprehensive inventory of parts is maintained.

This department is accessible directly from the street through the shipping and receiving area and has its own lobby and parts counter.

General offices are grouped in a 10,000-sq. ft. area accessible from another street. There are five enclosed executive offices. The remaining floor space is divided by 6-ft. high opaque glass partitions, and provide adequate and efficient space for the various departments, such as sales, credit, advertising, and general office.

An enclosed area for future I.B.M. system has been provided, complete with separate air conditioning equipment, as well as a separately enclosed air conditioned showroom which is used for sales meetings, dealer meetings, dealer shows, and dealer sales and service training.

3 Sales Divisions

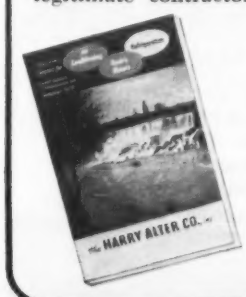
The L & P sales department for Fedders air conditioners is set up in three divisions, with separate sales managers and salesmen—room air conditioners, Thru-the-Wall air conditioners for new buildings, and Adaptomatic central, residential, and industrial units. Each division operates independently, yet they maintain close harmony as to policy, service, and procedure.

The advertising department handles all cooperative advertising for the dealers in all departments. L & P did more than 43% of all newspaper advertising in the air conditioning field in New York last year. In addition to newspapers, other media such as radio, direct mail, television, dealer promotion, billboards, and subway clock spectaculars are used.

The credit department works closely with dealers in helping them with their, and their customers', financial problems. Being sales minded, it has helped dealers secure business by solving the financial problems of each transaction as it came along.

"I CAN ALWAYS GET IT WHOLESALE . . ."

Does your customer ever say that to you? Well he can't get it wholesale from the Harry Alter Co. We sell you . . . not your customer. Our *Dependabook* is sent only to legitimate contractors and servicemen. We do not believe in back door selling.



We're Real Specialists in

REFRIGERATION • AIR CONDITIONING • ELECTRIC MOTORS

SUPPLIES and PARTS

SAVE MONEY, time and effort by ordering from our new *Dependabook*, the most complete catalog of all. 232 pages. Over 10,000 items carried in stock. *Wholesale only.* Your orders filled really fast by mail, or they can be picked up at one of our six big warehouses.

Write on your letterhead for the 1959 DEPENDABOOK . . .
Also our monthly Flyer of surplus and close-out Bargains.

THE HARRY ALTER CO., INC.

1717 S. Wabash Av. Chicago 16, Ill.	134 Lafayette St. New York 13, N.Y.	2332 Irving Blvd. Dallas 7, Texas	695 Stewart Ave., S.W. Atlanta 10, Ga.

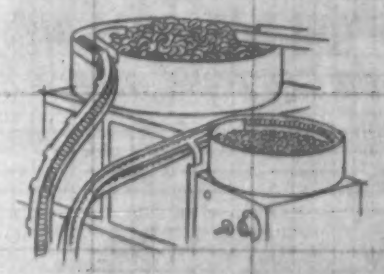
FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG WAREHOUSES

AUTOMATION

Reason why it pays to Auto-Braze with **Phoson** and **Sil-Bond** Brazing Rings

Automated brazing has mushroomed into prominence as a profitable production technique for fast, dependable metal joining. And, it's easily adaptable to most manufacturing processes! United's precision brazing rings are manufactured for automation! Teamed with United's engineering know-how, Phoson & Sil-Bond alloys continue to boost the profit picture for many manufacturing concerns. If fastening costs are one of your problems, why not consult your United Brazing Product distributor . . . or write direct giving complete details.

United Wire and Supply Corporation
Providence 7, Rhode Island



TYPICAL AUTOBRAZING EXAMPLE . . . PRELOADING PHOSON RINGS ON COPPER U-BENDS

For aluminum, brass and copper wire and tube
For silver brazing alloys . . . always Specify

UNITED

Men on the Move . . .

F. J. Evans Engineering Co. (Birmingham, Ala.) — JACK J. TYSON has been appointed executive vice president and sales manager. He was formerly vice president in charge of the Atlanta division. Also named to company offices were C. C. HEIM, board of directors; R. J. TUCKER, JR., treasurer; and A. F. KRUCKEBERG, secretary. The firm is a nine-state distributor for Janitrol heating and cooling equipment and Kathabar dehumidification equipment.

Baltimore Aircoil Co., Inc. — MORRIS B. OLDER has been appointed controller. He served 13 years as consulting accountant and auditor to the company while operating his own public accounting firm.

Mueller Brass Co. — JOHN R. RINKEVICH and ALEXANDER HINDMARSH have been appointed sales representatives. Rinkevich, who has been connected with the sales department at the main plant in Port Huron, Mich., was assigned to the Denver office. Hindmarsh has been assigned to the Cambridge, Mass. office. He has had many years' experience in the purchasing field.

Minneapolis-Honeywell Regulator Co.—J. A. DEPUY has been named central regional manager. He succeeds WESLEY R. MOORE, who is on special assignment as assistant to the president. Since 1955 DePuy has been assistant central regional manager in Cleveland.

Three men have been named to sales positions in the mid-Atlantic region. EDWARD J. KLEIN was appointed regional industrial manager with headquarters in Philadelphia. JOHN J. HORNER succeeds Klein as industrial manager of the Philadelphia branch office. CARL F. BOEHNLEIN has been assigned as industrial manager of the Richmond, Va. branch office. Klein succeeds O. B. PYLE, who is retiring but will continue as an account executive. Horner has been a salesman with Honeywell. Boehnlein has been a branch sales engineer. At Richmond, he succeeds W. H. REYNOLDS, who will be given another assignment.

Temprite Products Corp.—ROBERT W. GENTRY has been appointed direct factory sales representative in Ohio. He has been with Temprite for the past eight years in sales and application engineering.

Robertshaw-Fulton Controls Co. —D. REX SCOTT has been named general manager of the Western Research Center, Anaheim, Calif. He was named assistant general manager earlier this year. Scott succeeds THOMAS H. JEFFERS, who has been appointed director of facilities and tooling, West Coast operations.

Westinghouse Electric Corp. — BURR TUPPER has been appointed director of works engineering, succeeding WALTER W. WENDELKEN, who plans to retire. Tupper was manager of manufacturing for the Westinghouse air conditioning division.

In the major appliance division, JOHN F. MOYER was appointed advertising manager of the Refrigerator-Freezer Dept. in Columbus, Ohio. He succeeds R. R. BURKHOLDER, who resigned to form his own agency in Columbus. DON C. GIFFORD, formerly national sales representative for laundry equipment, succeeds Moyer as manager of dealer promotions.

GEORGE T. GEISER has been named manager of the new supply depot to be built in Columbus. He has been planning manager of the distribution service department.

Embassy Steel Products, Inc.— BRUCE BOTWAY, Plainview, L. I., has been promoted from factory sales engineer to district sales manager.

Carrier Corp. — GEORGE C. GARRETT has been appointed branch sales manager of the Machinery & Systems Div. in Miami.

Narowetz Heating & Ventilating Co. (Chicago) — LAWRENCE O. PAUL was elected president, succeeding the late Louis L. Narowetz. JAMES MRAZ is vice president, J. STUART ANDERSON secretary and treasurer

Simpson Electric Co. — MEL BUEHRING, sales manager, was appointed director of sales. WILLIAM JOHANSEN, assistant sales manager, was named sales manager of the Instrument Div. LOWELL DE WOLF was appointed sales manager of the Automotive Div.

Other appointments: HARRY JONES, as controller; WILLIAM COON, director of engineering, as technical assistant to the president; PETER DE PAOLO, chief engineer, as director of engineering; IRVIN REBESCHINI, as chief engineer of electronic test equipment; ED EBENSEN, as chief engineer of automotive test equipment. Jones succeeds ARCH WEINDORF, who was named treasurer of the parent firm, American Gage & Machine Co.

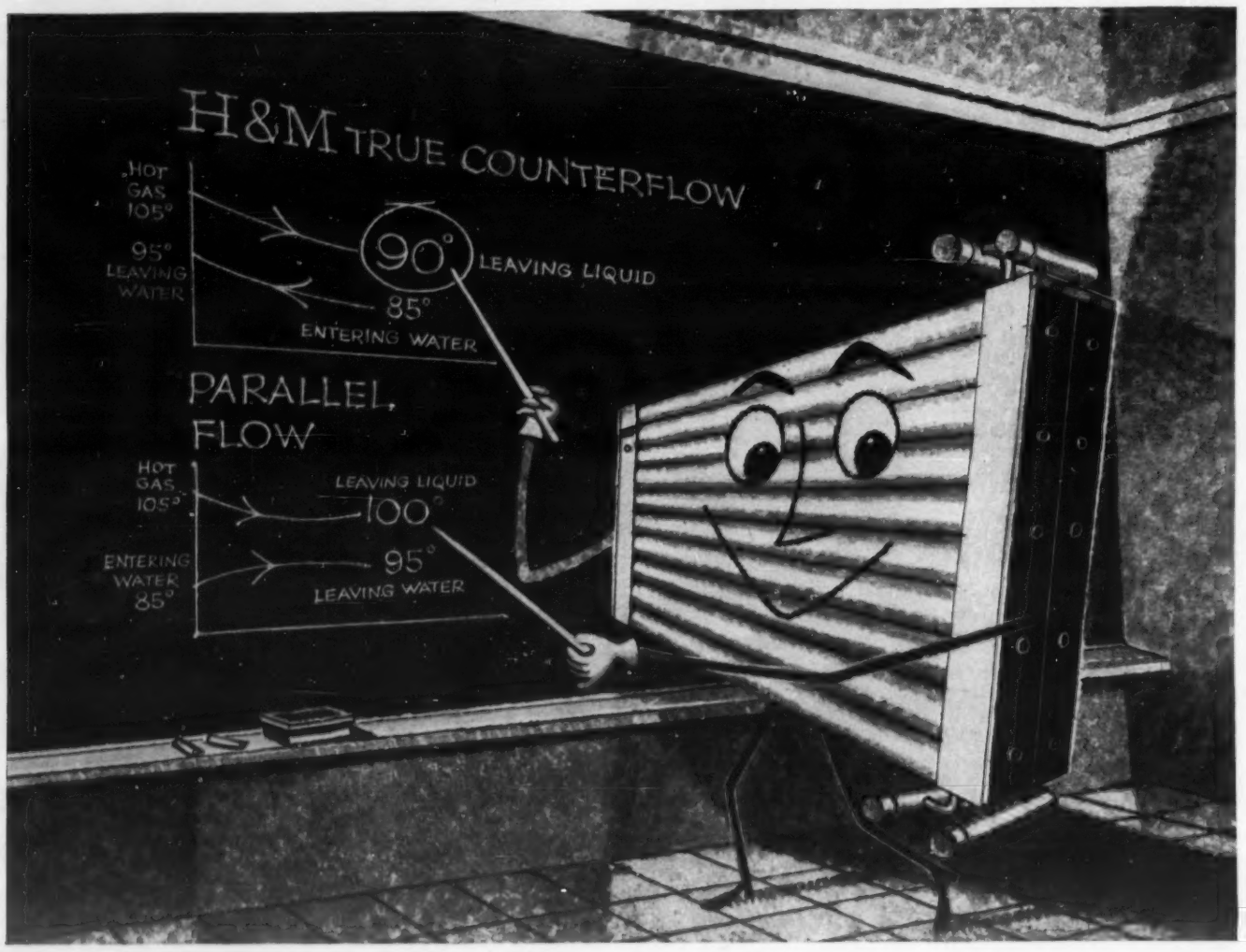
York Corp.—CHARLES L. VANARSDELL, JR. is the new Cincinnati branch manager. He has been active in the air conditioning field for several years.

Hotpoint Co.—ROBERT P. ALLISON, JR. has been named manager of manufacturing for the commercial equipment plant in Chicago Heights, Ill. He will be responsible for manufacturing and production of Hotpoint's commercial electric cooking equipment, plus the recently-announced line of General Electric water coolers on which production was started in June. Allison was formerly manager of manufacturing of G-E's Weathertron department, air conditioning division. He succeeds the late Robert E. Bryan.

Howard Refrigerator Co., Inc.— CHARLES A. NEIMAN has been appointed to the application department of the engineering division. He most recently served with C. V. Hill & Co.

Fairbanks Whitney Corp.—ROBERT W. KERR, vice president in charge of all subsidiary operations, was elected president of Fairbanks, Morse & Co., subsidiary. He succeeds ROBERT H. MORSE, JR., who was named vice chairman of the subsidiary. FRANK H. GANKAR was named administration vice president of Fairbanks, Morse.

A. M. Byers Co.—GERALD L. JENSEN has been appointed field service engineer for the Pacific northwest. He was formerly associated with Crane Co. in Seattle.



BEFORE YOU BUY, THINK:

Will you get adequate subcooling from your condenser?

You will if it's an H&M water-cooled condenser with true counterflow heat exchange

In Halstead & Mitchell water-cooled condensers the refrigerant and cooling water are introduced in true counterflow, as shown in the chart. Test results indicate an average of 15 degrees of subcooling in H&M condensers. Liquid refrigerant leaves at a lower temperature and system capacity is increased about ½% for each degree of subcooling without additional power input.

H&M condensers feature double-tube design, seamless copper tubing, brass headers. End plates are easily removed for quick, safe, *mechanical* cleaning. Water tubes are generously sized for low pressure drop and minimum maintenance. Available in ⅛ to 25 ton capacities, condenser types are Standard (½" and ⅝" O.D. water tubes), Heavy Duty (⅝" O.D. water tubes), and Sea Water (⅝" O.D. cupro-nickel water tubes), and are U/L approved. Order them from your refrigeration wholesaler and use them singly or on racks. Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.

H&M WATER-COOLED CONDENSER WITH TRUE COUNTERFLOW

Halstead & Mitchell

Water-Cooled Condensers • Cooling Towers • Air-Cooled Condensers • Finned Coil Products

Send this LABEL from any 'SUPCO 88' Bottle

We will send you

FREE

THIS VALUABLE

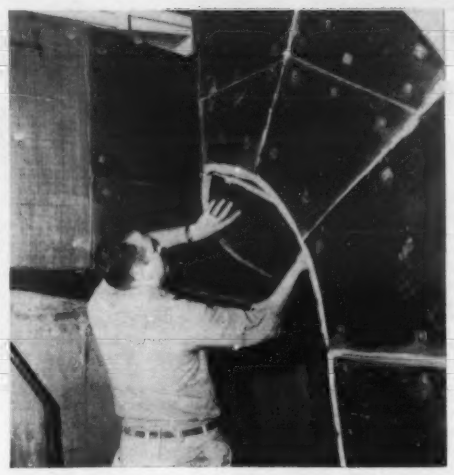
REPAIR INFO KIT

- Relay Diagrams
- Sealed Unit Terminal Connections
- Diagnosis Chart
- Capillary Chart
- "Supco 88" E Z Read Chart

A BUNDLE of information that took years to compile is yours, FREE with your first purchase of "Supco 88" — THE MIRACLE OIL ADDITIVE FOR REFRIGERATION USE!

SEALED UNIT PARTS CO., Inc.
1178 East 180th St. • New York 60, N.Y.

STUDS were welded with a Graham stud welder to the warm air duct supplying second floor classrooms at the new Fairport high school. The casing upon which the workman is kneeling houses both the fan and heat exchanger which warms the air at each fan location. After being cut to size, the Baldwin-Hill semi-rigid duct insulation was impaled on the studs.



SPUN mineral wool insulation was easily cut and shaped to fit the irregularly shaped and curved surfaces of the warm air supply duct.

INSULATION'S factory-applied vapor barrier is permanently sealed at joints and stud projections with asphaltic mastic. Warm air, carried by the insulated duct, is mixed with ambient air in the pipe tunnel seen at each riser. Damper opening which permits entry of fresh air is thermostatically controlled and the tempered air is supplied to each classroom through underfloor conduits.

1-In. Insulation Prevents Heat Transfer

Warm Air Supply Ducts Run In Underground Tunnels Which Also Carry Fresh Air In Unusual School Heating System

FAIRPORT, N. Y.—One of the features of the new Minerva Deland High School here is an unusual heating system.

An interesting feature of the heating installation is that the warm air supply ducts run through large underground tunnels which themselves carry the fresh air supply.

At each classroom, or other heating zone, the warm and the fresh air are mixed in proportions controlled by thermostat setting, and this mixture is delivered through 14-in. diameter conduits to tempered air registers located under the windows in each room.

The main warm air supply is delivered by a 45,000 c.f.m. fan through ducts 7 ft. wide by 4 ft. high. Heated air for the auditorium, gymnasium, swimming pool, and a second-floor classroom area are supplied separately by smaller fan units. At each fan location the air is warmed by coils carrying 220° F. water from a central hot water supply.

Twenty-one thousand square feet of semi-rigid, spun mineral wool duct insulation 1 in. thick prevents heat transfer between the warm and fresh air supplies, thus insuring a correct mixture of warm and fresh air at the thermostatically controlled dampers, according to Baldwin-Hill Co.

Lightweight and non-irritating to handle, the insulation, manufactured by Baldwin-Hill, was applied in flat sheets with its factory-applied vapor barrier on the outside.

"Simplicity marks the application procedure," the company said. "First studs were welded to the duct surface at appropriate intervals and the panels of insulation, easily cut to size with a knife, were impaled on the studs.

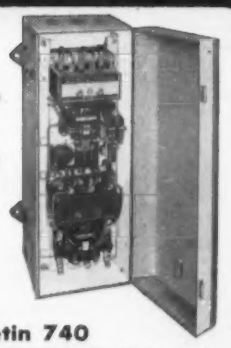
"The flexibility and resilience of the material permits a close fit to the metal surface. At curved duct sections the spun-wool panels were scored on the inside so that they could be bent to fit closely and neatly to the rounded surface.

"The insulation was permanently secured with self-locking washers. Joints and points of penetration of the studs were sealed with asphaltic mastic to insure the integrity of the vapor barrier."

The school was designed by Ben Ade, Rochester, architect; and the heating system by Albert Hartsig of Peck Associates, Fairport. William Schmitt, Inc., Rochester, installed the heating system and E. J. Eddy, Inc., Rochester, a subsidiary of Mundet Cork Corp., the insulation.

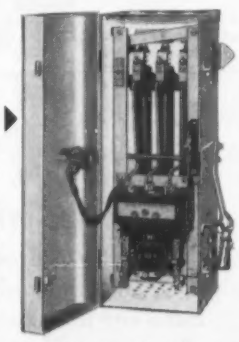
IMMEDIATE DELIVERY
YOU KNOW YOU CAN DEPEND ON
THE WHOLESALER
who SELLS and STOCKS
KESCO
THERMAL OVERLOAD PROTECTED
AUTOMATIC CONDENSATE WATER
DISPOSAL PUMPS
WHOLESALERS Write to
KESCO PRODUCTS
Jamaica 13, N. Y.

Where "starting current" limitations must be satisfied—
ALLEN-BRADLEY STARTERS have no equal



A-B QUALITY

Bulletin 640
Stepless acceleration of heavily loaded compressor motors is provided with A-B Bulletin 640 graphite compression disc resistance starters. The Bulletin 640 is operated by hand lever. Smooth starting is under control of the operator. No more lamp flicker.

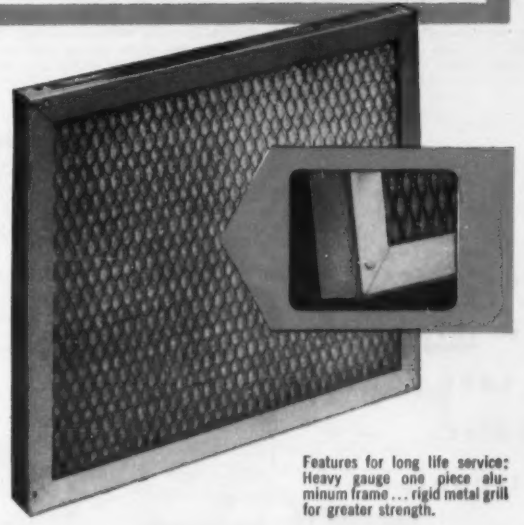


Bulletin 740
With the A-B Bulletin 740 reduced voltage starter, graphite disc resistors are automatically inserted in series with the motor for velvet smooth starting. These resistors can be adjusted to motor and load conditions for stepless acceleration of the motor.

Allen-Bradley Co., 1313 S. First St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY
Member of NEMA
Quality Motor Control

YOU make more profit per filter sale with Skuttle-aire permanent filters!



Features for long life service: Heavy gauge one piece aluminum frame... rigid metal grill for greater strength.

Here are the reasons why you get more with Skuttle-Aire:

because they're permanent... built for lifetime wear.

because they're cleaned in a jiffy when dust and dirt particles gather, simply remove, clean with plain water and replace ... that's all there is to it.

because they're maintenance-free... nothing to wear or replace, never need oiling.

because they're filled with new-type filtering material ... multiple layers of specially woven plastic filaments with permanent electrostatic qualities, making it the ideal dust and dirt collecting agent.

SKUTTLE-AIRE permanent filters are available in all sizes for furnaces, central air conditioning systems and room coolers.

Write today for complete information on Skuttle's quality products that give you more profitable sales.

Skuttle MANUFACTURING CO.
MILFORD, MICHIGAN
IN CANADA: WAIT-SKUTTLE CO., OAKVILLE, ONT.

TECHNICAL CENTER

By Frank J. Versagi, Technical Editor

Instruments In Service Work (6)

Excerpts from G-E's Operating Instructions For H-6 Leak Detector

Together with the accompanying operating instructions from G-E's instruction booklet, the information in the preceding article provides an evaluation of a unique product designed to help the practical man.

WARNING: Do not use the leak detector in any combustible or explosive atmosphere. The sensitive element operates at a temperature in the range of 1,300° F. to over 1,650° F. (700° C. to over 900° C.).

PRELIMINARY OPERATION

Each time the leak detector is used, prepare it for operation as follows:

1. Plug the power cord into a properly rated power source (see SPECIFICATIONS). If the outlet will not accept the grounding-type plug, use the adapter (supplied), connecting the grounding wire to a good "earth" ground (such as a water pipe).

2. Rotate the SENSITIVITY knob fully clockwise. (See CAUTION note below Step 3.) This will turn on the power as indicated by the pilot lamp in the Control Unit, and will set the amplifier for maximum sensitivity.

3. Allow about one minute for the element and the electron tubes to warm up.

CAUTION: a. If a leak indicator lamp lights continuously, or flashes repeatedly, or is erratic in any other way, turn off the power immediately and refer to the TROUBLE SHOOTING section.

b. If a loud rattling noise is heard when the unit is turned on the air-pump armature is set too close. To adjust it, turn the air screw, inside the small hole (marked AIR) in the front of the Control Unit counterclockwise until the rattling stops; then turn it one-half turn more. **(Editor's Note:** General Electric should give this more thorough treatment, because even when the pump does not "rattle" the air flow may be so great that sensitivity is reduced. Optimum performance is realized when air flow through the probe is approximately 1.4 cu. ft. per hour. This flow is established when the probe lamp "flash" occurs 1 second after the tip of the 6-ft. probe "sniffs" a leak (2 seconds for 15-ft. probe). If flash occurs quicker than this, air flow is too great and the "AIR" screw should be turned counter clockwise. If response time is greater than the 1 second (2 seconds for 15-ft. probe) sensitivity will be improved, but AIR screw should be turned clockwise.)

4. Turn the SENSITIVITY knob back (counterclockwise) about halfway, and wait for two or three seconds; then quickly turn the knob clockwise a few degrees. The probe lamp should flash on, indicating that the element has warmed up, and that the unit is ready to detect leaks.

IMPORTANT: Read CHECK LIST FOR PROPER OPERATION before using the equipment.

LEAK SEARCHING PROCEDURES

CAUTION: The Type H-6 leak detector is design for intermittent use only. Do not operate it longer than 1 hour at a time (or not more than 1 hour total operation in any 2-hour period).

The normal procedure for locating leaks is **direct probing.** An alternative procedure, known as **accumulation probing** is sometimes used to test small sealed units that can be placed in a box or plastic bag.

DIRECT PROBING

The recommended method for direct probing of joints, seams, and fittings is to move the probe slowly (at about 1 in. per second) along the underside of the unit being tested, holding the probe tip as close as possible to the suspected area of leaking. (Fig. 1.)

If the lamp in the probe flashes, pinpoint the leak as follows:

1. Lift the probe about 10 in. away from the area for about 1 second.

2. With a "dipping" motion ("dipping" means to touch the suspected leak area and promptly lift the probe away about 10 in.) check the area approximately 1 in. to the rear of where the flash occurred. If the lamp flashes again the leak may be at this point. To be absolutely sure, "dip" the probe tip in several places (one at a time) around this point. If the lamp flashes at more than one point it indicates that either a large leak, or two or more small leaks have been encountered.

Note: When a large leak, or two or more small leaks close together have been encountered, the probe lamp will flash about 1 second after the probe tip is brought into the envelope of gas (which surrounds the point of leakage) from any direction. To pinpoint a leak under this condition, reduce the sensitivity and dip the probe tip in several points (one at a time) where the leak may be. If the probe lamp flashes at more than one point, reduce the sensitivity still more and repeat the check until the probe lamp flashes only after touching **one** point. A flash at only one point indicates that a leak is occurring at this point.

3. Repair leak.

4. Increase sensitivity to its original setting and test area again.

NOTE: The numbers on the SENSITIVITY dial are arbitrary and should only be used to signify relative sensitivity. This is because the sensitivity of the sensitive element may decrease or even increase slightly each time the leak detector is turned on. Also, the maximum sensitivity of the sensitive element gradually changes with use from about 0.1 oz. per year when new, to about 0.5 oz. per year at the end of useful life (approximately 100 hours). Example: After about 60 to 80 hours of operation, a knob setting of 4 or greater will probably be required to obtain the same sensitivity as a setting of 2 or 3 will give with a new sensitive element.

ACCUMULATION PROBING

The accumulation method of probing is used primarily when increased sensitivity is desired, or when a test for over-all leakage is needed. The unit to be tested is placed in a tight enclosure (such as a box or plastic bag) and leakage, if any, is allowed to accumulate for minutes or hours, depending on the sensitivity required. After the accumulation period the interior of the enclosure is probed through a small hole near the bottom of the enclosure. A flash of the probe lamp will show that leakage has occurred; however, the exact location of the leak can only be determined by direct probing (provided the leak is not so small that the leak detector is incapable of detecting it).

Accumulation method can be used to detect much smaller leaks than can be detected by direct probing.

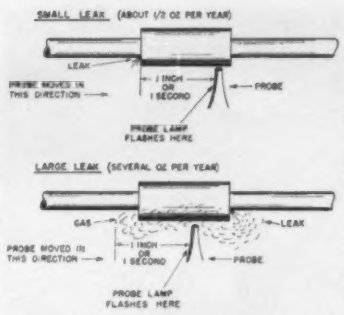
AUTOMATIC BALANCE

The automatic balance circuit in the Type H-6 leak detector will automatically balance out any constant or slowly changing concentration of refrigerant gas in the test area. The Type H-6 leak detector will give a leak signal only when the probe encounters an **increase** of refrigerant concentration such as when the probe passes near a leak of 0.5 oz. per year (or more) and the background concentration is not too high—the limit of concentration being about 100 parts per million.

When the leak detector sensitivity is properly adjusted to give one short flash when the probe is inserted and withdrawn from the Halogen Reference Source (see Step 4 in the CHECK LIST FOR PROPER OPERATION), it will detect leaks of about 0.5 oz. per year or more. A leak of 0.5 oz. per year is equivalent to an increase of 10 parts of refrigerant in a million parts of air that is drawn into the probe.

Leaks of about 2 oz. per year can be located even if the background concentration is in the neighborhood of 300 parts per million.

Even though this automatic balance feature permits using the Type H-6 leak detector to locate small leaks in areas with some refrigerant contamination, the sensitive element life will be shorter than would be the case if the atmosphere were free of any refrigerant or other halogen-compound vapor.



DIRECT PROBING with electronic leak detector. (Fig. 1.)

It is therefore recommended that the test area be ventilated. Refrigerant gases are heavier than air; therefore, if an exhaust is to be installed it should be located near the floor.

CHECK LIST FOR PROPER OPERATION

Operation of the leak detector can be checked by performing the following "check-out" procedure in the order given. If difficulty is experienced in performing the check-out procedure, refer to the TROUBLE SHOOTING section and/or MAINTENANCE section.

1. Make sure power is on. (Pilot lamp lit, and unit vibrates.)

2. Make sure leak detector has warmed up for at least 1 minute.

3. Lamp in probe should not light except under the following conditions:

a. When air sample that is being drawn through probe contains an **increasing amount** of refrigerant or some other halogen vapor, lamp should flash once (twice if increase of concentration of halogen vapor in air sample is high).

b. When SENSITIVITY knob is turned rapidly (clockwise or counterclockwise) lamp should flash once.

c. Any sharp rap on the Control Unit may cause lamp to flash.

d. Setting leak detector on a vibrating surface may cause lamp to flash.

e. Moist air (such as breath) entering probe may cause lamp to flash.

f. When air flow is suddenly reduced or cut off, as by putting the finger over the end of the probe, lamp may flash.

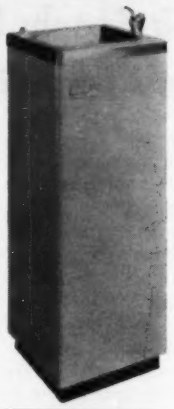
g. Static in power line, such as happens when elevator or electric appliance is turn on or off, may cause lamp to flash.

4. Make sure sensitivity is 0.5 oz. per year or better. The sensitivity can be checked conveniently by use of a Halogen Reference Source (test bottle), Cat. No. D50W133B, such as is included in the Maintenance Kit, Cat. No. 5482572G2 (a recommended optional accessory).

5. Make sure leak detector response time is proper (see SPECIFICATIONS). The response time can be easily checked by observing the time it takes for the leak indicator lamp to flash after the probe is inserted and quickly removed from the test bottle. The flash should occur after about 1 second with the 6-ft. probe tube, and about 2 seconds with the 15-ft. probe tube. If the response time is substantially longer, the air flow should be increased by rotating the air-flow adjusting screw clockwise (accessible through the hole marked AIR in front of the Control Unit). Do not turn the screw so far that the pump rattles.

(NEXT: Miscellaneous Detectors)

WATER COOLER



10 GALLON PRESSURE TYPE

$139.50*

*TO DEALERS ONLY

- STURDY • ECONOMICAL
- STAINLESS STEEL DRAIN TOP
- STAINLESS STEEL COOLING TANK
- ⅓ H.P. TECUMSEH HERMETIC UNIT
- PRE-COOLER
- 5 YEAR WARRANTY ON REFRIGERATION CYCLE

REMCOR Model CW-10

REMCOR PRODUCTS COMPANY
321 EAST GRAND AVENUE,
CHICAGO 11, ILLINOIS
manufacturers of water coolers since 1940

TAKE IT ON EVERY JOB!

There's a chemical genie in Thawzone that works like nothing else in the world to cure and prevent trouble in refrigeration and air conditioning systems.

It eliminates freeze-ups • destroys trouble-causing moisture • helps prevent corrosion and copper plating • scavenges out oxygen • helps keep expansion valves free of sludge and rust • You avoid call backs caused by freeze-ups after servicing.

Take Thawzone on *every* job, use it in *every* installation charged with the modern fluorine refrigerants (*Freon**, *Genetron**, etc.) or with methyl chloride, methylene chloride or isobutane. It's economical: ½ oz. treats a pound of refrigerant. And it's easy to use.

See your refrigeration wholesaler today for Thawzone and the free Thawzone Service Manual.

*Reg. Trade Marks: Du Pont & Allied Chemical Corp.

TWO OTHER AIDS FOR BETTER REFRIGERATION SERVICE

TRACE
—the simple, fast way to pinpoint refrigerant leaks . . . a positive leak tag.

Leak Lock
—the joint sealer engineered for refrigeration use.

THAWZONE®
HIGHSIDE CHEMICALS INCORPORATED
18 Colfax Avenue • Clifton, New Jersey

Thinking of —

- **changing territories**
- **expanding your territory**
- **taking on new lines—**

Check the CLASSIFIED ADS

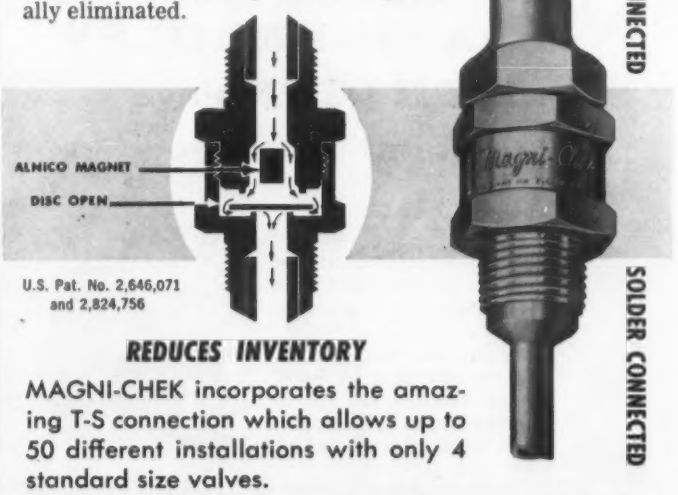
Your opportunity may be there.

SNAP-ACTION in MAGNI-CHEK valve

by WATSCo

MAGNI-CHEK is a non-electric magnetically operated check valve. Since no springs are used it therefore cannot be affected by operational or soldering heat.

MAGNI-CHEK incorporates a floating disc controlled by a lifetime alnico magnet. The pressure required to either snap open the disc or snap it closed is fractional and, therefore back pressure is practically eliminated.



U.S. Pat. No. 2,646,071 and 2,824,756

REDUCES INVENTORY

MAGNI-CHEK incorporates the amazing T-S connection which allows up to 50 different installations with only 4 standard size valves.

For additional information on MAGNI-CHEK and the T-S connections write to Dept. NN-7

WATSCo INC.
1020 E 15th STREET • HIALEAH, FLORIDA

Jewett Ships Its Largest Export Order to Greece

BUFFALO—The Jewett Refrigerator Co. Inc. has shipped its largest single foreign order —43 blood bank refrigerators for the Greek government.

The company also reported that an order for children's refrigerated mortuaries was being filled. The unusual request came from Ceylon.

While the shipment to Greece is the largest single order for the company, export of blood bank refrigerators is common for the firm, which specializes in medical, hospital, and clinical refrigeration.

The Buffalo-made blood bank refrigerators have gone to most of the South American countries, Israel, Iran, Ceylon, Egypt, Korea, the Philippines, Portugal, Italy, Pakistan, and even to Dr. Albert Schweitzer's clinic in French Equatorial Africa, according to Jewett's announcement.

Paying for the life-saving equipment are charity organizations in the United States, foreign governments, World Health Organization and private foreign hospitals and clinics.

The local company says it now has its blood bank refrigerators in 90% of the hospitals in the United States.

The Greek blood bank refrigerators are standard type. They hold, on revolving shelves, 175 pints of blood and maintain a temperature of between 39.2 and 43.8°.

Mortuaries for storing human bodies in morgues and hospitals have also been standard items for many years. The company is now working on a single order of 127 mortuary units to fill a New York City order.

No request astounds officials of the specialized company, which even turns out freezers for human bones. They are to preserve bone in the case of amputation or retain bone of deceased persons to replace diseased bone in living persons.

One of the orders for a bone freezer came from the University of Buffalo Medical School which also bought a frog refrigerator from the local company.

"We did have one order which surprised us," said Allan D. Pearson, vice president. "CBS ordered a mortuary table for a Studio One TV production. The table was one of the chief props for the play, 'No Deadly Medicine,' which appeared on TV last December and starred Lee Cobb."

Barnebey-Cheney Names 2 to Staff

COLUMBUS, Ohio — Two staff additions have been announced by Barnebey-Cheney here, manufacturer of activated charcoal and derived equipment.

Robert Giesecke, a native of Mexico and formerly in export work in Akron, Ohio, will handle activated charcoal sales overseas while Donald R. Lee joins Barnebey-Cheney as a sales engineer in the Bulk Charcoal Dept.

4 Whirlpool Men To Participate In Exhibition In Russia

ST. JOSEPH, Mich. — Four Whirlpool Corp. men have departed for Moscow to participate in the American National Exhibition to be held in that city beginning July 25.

The Whirlpool group includes Juel M. Ranum, who has headed up the project since Whirlpool accepted the state department's invitation to participate; Don Moore, who is in charge of engineering and technical matters; John Hauf, technician for the Whirlpool exhibit; and William R. Vitous, production manager and coordinator for the demonstrations.

"From the time they arrive in Moscow, the Whirlpool contingent will be on a rigorous, seven-day a week schedule," it was noted. "The Miracle Kitchen and the Demonstration Kitchen will be carefully checked as they are assembled and after each day's showing. Present plans call for demonstrations continuing through 12 hours per day on week-days and 14 hours on Saturdays and Sundays."

Johnson Picks Hagerman

MILWAUKEE — Johnson Service Co. here, manufacturer of automatic temperature and air conditioning control systems, has announced the appointment of Stephen T. Hagerman as manager of its international division.

Hagerman

He will headquarter in the company's new building at 11-26 47th Ave., Long Island City.

Book Covers 'European Refrigeration Research and Its Practical Applications'

WASHINGTON, D. C. — A thorough survey and description of "European Refrigeration Research and its Practical Applications" is available in a book of that name published by the European Productivity Agency of the Organization for European Economic Co-operation in Paris, France.

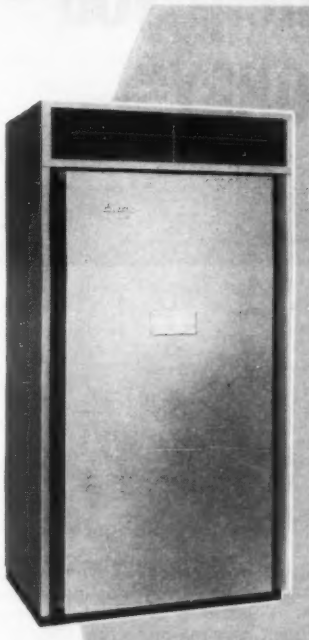
Covering everything from recruitment and salary scales of research personnel to lists and descriptions of research organizations and projects in 12 European countries, the book offers general and specific information of value to American manufacturers as well as research groups.

Country by country, the report defines research projects having to do with such subjects as food handling, machine design, gas air conditioning, cold drying of blood, insulating materials, absorption equipment for low temperature work, transport refrigeration, and instrumentation.

Among many informative tabulations are a list of universities and other institutions in Europe offering courses on refrigeration and its applications; a country by country list of research organizations, government and private; a list of European films and literature.

Copies of the 236-page, paperbound book are available at $3.50 from the Washington Office of OEEC at 1346 Connecticut Ave., NW.

You get a BIGGER PROFIT from Curtis



Here are three important reasons why . . .

MINIMUM SERVICE

Long operational life of Curtis equipment combined with peak performance, assures more customers and less service requirements.

PRE-SOLD PROSPECTS

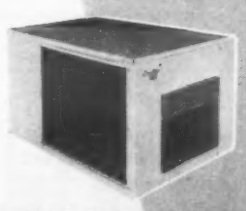
National advertising beamed at virtually every prospect category helps pre-sell Curtis equipment for you. Curtis provides sales and promotional aids to make your selling job easier.

PRICED FOR PROFITS

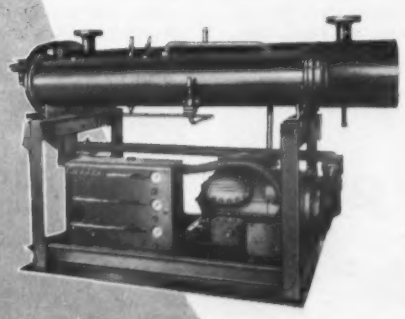
All Curtis equipment is competitively priced, with a very generous profit margin for you!

Remember, there is no finer, more efficient, durable line on the market today. Depend on Curtis for quality and profit.

Packaged air conditioning units —3 through 20 tons.



Packaged Air Cooled Air Conditioning Units —2 through 7½ tons. Residential and commercial applications.



Packaged Liquid Chillers—7½ through 100 tons—F-12 or F-22—with new 1959 Curtis Motor-Compressor Unit.

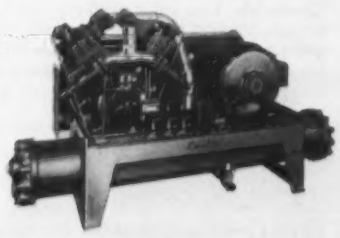
Packaged Air Conditioning Units—20 through 50 tons—with the new 1959 Curtis Motor-Compressor Unit.

REMEMBER YOU CAN COUNT ON Curtis

MANUFACTURING COMPANY

REFRIGERATION DIVISION

Write: Dept. 1 • St. Louis 20, Mo.



Condensing units up to 100 tons —F-12 or F-22.

C-54

OUR 105th YEAR

Refrigeration Problems
And Their Solution
(As Written by Paul Reed)

Painting a Condensing Unit

QUESTION:

My boss used to be in the Navy and does he like things ship-shape and spick-and-span! You should see our shop! You could almost eat off the floor. And everything in its place, and a place for everything. Our trucks are painted white and we all wear white coveralls. You'd think it was a dairy from appearances.

He and the salesmen even bring customers back to the shop; like showing the kitchen to restaurant customers, I guess. It goes over big, too. It seems to make the customers feel that if we are so neat and clean in the shop, our work must be the same.

They are right at that. The boss is a stickler for good workmanship, and quality too. But above all, everything must be clean and neat. Since I came here, he has fired two men for being sloppy. They were pretty good mechanics too.

It must pay off though. There are nine of us in the service department now and there were only four besides me (I'm the shop man) when I started to work here only three years ago.

Everything that we repair or overhaul in the shop has to go out looking like new. Our spray booth is about the busiest part of the shop. If they look scratched up, even motors and controls get repainted.

A couple of years ago, I got the idea of putting in a bright-dip tank. That made a hit with the boss, for we can clean up the fittings and other parts that are tarnished and corroded, and make them look like new.

It has saved us some money, too; not only in salvaging some parts that we couldn't have used otherwise, but also in labor. It takes a lot of time to clean things up on a wire wheel and burnisher. We've putting in a bigger bright-dip tank soon, so that we can put some larger pieces in it.

But what caused me to write you is this: I think that the boss goes too far with some of this painting business. He insists that we use a heavy enamel on compressors, so that it gives a nice smooth finish and covers up the right iron surface.

I think that the thick coat of enamel keeps the compressor from cooling off as it should.

Am I right, or does it make any difference, or at least enough difference to amount to anything?

So far, I have been able to convince him that we shouldn't repaint air-cooled condensers. That was one reason for building a bigger bright-dip tank. Also, I have a spray gun on which I use 100 lbs. of air to spray condensers with an Oakite solution. It cleans them quickly.

But he insists that I paint water-cooled condensers with that same heavy enamel. I suppose that is all right, though, for the water does the cooling.

ANSWER:

Congratulations to your boss? It is evident that not only is he quality and cleanliness conscious, but he is a shrewd businessman. Neatness, cleanliness, and orderliness inspire confidence, and confidence is one of the greatest assets and business builders a company can have.

It is no accident or luck that he has succeeded in building his business. He would probably have succeeded in almost any other business in which he came into direct contact with and rendered a service to the user.

Old-timers can remember that when automobiles first came into use, the user had to go to a garage to get his gasoline and oil. The garage was often dirty and cluttered up, and the floor greasy and slippery.

Then the filling station appeared. It was clean and well kept. The attendants wore uniforms and changed them frequently. Not only did they not soil the car themselves, but they cleaned the windshield. Their service was prompt and quick.

Who got the gasoline and oil business—and later, accessories? Quite naturally it went to the filling stations.

Every refrigeration and air conditioning dealer or independent service company should take a look at his own establishment. Are his windows clean, and if there are any products displayed in them, have they been dusted lately?

His service cars are in the eyes of the public daily; are they good advertisements? Are his men neat, and do they change their coveralls frequently? On the customers' premises are his men courteous and careful, or do they scar the walls or floors, moving equipment in or out? When they leave, do they leave scraps lying around, and smudges on the refrigerator or walls?

Do their repaired parts look rebuilt or just tinkered with? It's a lot easier to get a good price for equipment that looks like new or rebuilt, than if it was just repaired—maybe looks worse than it did before it was worked on.

PAINTING COMPRESSORS AND CONDENSERS

However, you are right about the paint. It would be better to use a thinner paint on the compressor. All that is necessary is to "color" the compressor. Improving the surface finish is not worth the loss in the efficiency of the compressor by covering it up with a thick, insulating coat of heavy enamel or paint.

A compressor should be able to radiate as much of its heat of compression and friction as it can. Also there is less possibility of burning out valves or even bearings.

The manufacturers use a light-bodied paint sprayed on lightly. There is not a great deal of difference in the type of paint or enamel as far as its ability to transmit heat is concerned. However, it should be thinned down to a very light body that will sufficiently color the compressor. It not only saves paint, but it is better for the compressor.

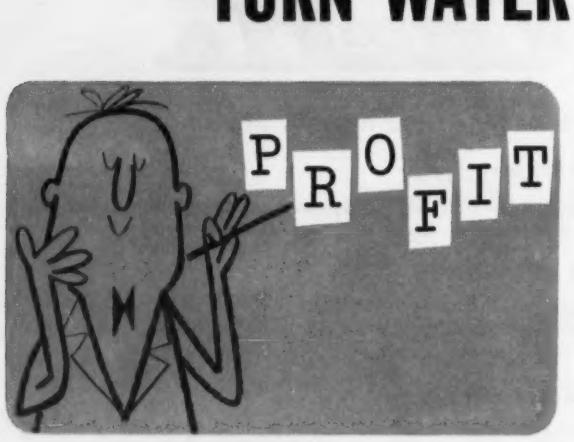
While it is true that the water passing through a water-cooled compressor carries away most of the heat, some types of water-cooled condensers depends somewhat on radiation of heat to the air around them.

This is particularly true of the concentric-tube or tube-within-a-tube type of condenser. The water flows through the inner tube and the hot gas through the outer space between the two tubes.

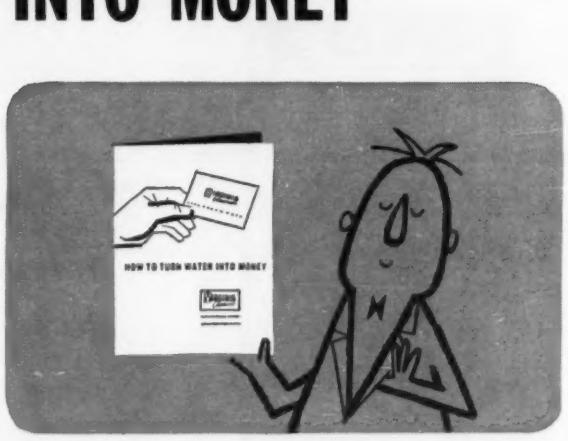
Such a condenser radiates a sizable amount of heat to the air, and thus relieves the water of some of the load. On condensers of this type, it is not good practice to paint the tubes, although they should be reasonably clean and free of dirt, dust, and corrosion, so that they can more effectively radiate heat.

Nearly all water-cooled condensers radiate some heat, so it is not good practice to paint them in such a manner as to retard the radiation of heat. Shell-and-tube, shell-and-coil, and similar condensers should be painted for the sake of appearance and to prevent excessive corrosion, but the paint should be similar to that used on the compressor.

from "VIRGINIA"—a new plan plus the right chemicals to help you "TURN WATER INTO MONEY"



The plan—a new kind of water treatment service that spells P-R-O-F-I-T. Your regular customers will want it—and it makes a wonderful door-opener and sales-closer on new accounts, too. Requires virtually no special training—and "Virginia" can provide lab and field service as needed. Best of all, the plan goes hand-in-glove with services you now offer.



How to get the plan? Easy. It's all spelled out in a free booklet offered by "Virginia"—"How to Turn Water into Money." The plan shows you how to make yourself so valuable to your customers—by saving them money—protecting their equipment—preventing mechanical failures—that you will see your company profits and prestige take a steady upgrade.

What makes the plan work? "Virginia" Water Treatment Chemicals. You get everything you need for reliable, effective service. Protect equipment, retard buildup with Water Treatment Scale and Corrosion Inhibitor. Remove scale fast with Liquid Scale Remover in easy-pouring plastic container —with Solid Scale Remover for extra safety.

Other "Virginia" chemicals include Algae-Cides #1 and #2 for eliminating various types of algal slimes—and Ice Machine Cleaner. For your free copy of the "Virginia" booklet, "How to Turn Water into Money," write to Refrigeration Division, VIRGINIA SMELTING COMPANY, 136 Jefferson St., West Norfolk, Va. Do it today—you'll be glad you did!

ESOTOO • V-METH-L • CAN-O-GAS • VASCOCEL • PERMAGUM • PRESSTITE TAPE • SUNISO REFRIGERATION OILS
WATER TREATMENT CHEMICALS • NATIONAL SALES AGENT & REPACKER FOR DU PONT'S "FREON" REFRIGERANTS

Available in Canada and many other countries

VIRGINIA® Chemicals

Plant Vacation Schedule

Final Listing

This is the fifth in a series of handy guides to summer vacation or inventory shutdown schedules announced by manufacturers. It is published to help salesmen avoid useless calls and to insure purchasing departments of adequate stock on hand. This list will not be repeated. CLIP and SAVE for future use.

Company	Shutdown Period Plant	Office	Shipments From Plant
A.R.A. Mfg. Co.	8/17-8/28	8/17-8/28	Emergency
Airtemp Div., Chrysler Corp.	8/17-8/30	8/17-8/30	Emergency
Baltimore Aircoil Co., Inc.	8/31-9/4	Open	Stock only
Bendix-Westinghouse Div., Bendix-Westinghouse Automotive Air Brake Co.	8/24-8/31	8/24-8/31	Emergency
Bohn Aluminum & Brass Corp. Betz Div.	8/10-8/22	Open	Stock only
Copeland Refrigeration Corp.	8/17-8/28	8/17-8/28	Emergency, Stock only
Dunham-Bush, Inc. West Hartford plant	8/22-8/30		Emergency
Heat-X plant	8/22-9/7		Emergency
Ebco Mfg. Co.	8/21-9/8	8/21-9/8	Emergency
Friedrich Refrigerators, Inc.	8/10-8/23	8/10-8/23	Stock only
Frigidaire Div., General Motors Corp.	8/24-8/30		Regular
Gibson Refrigerator Co., Div. of Hupp Corp.	8/16-8/29	Open	Regular
Heat Controller, Inc.	8/17-8/30	Open	Regular
I. W. Air Conditioning Corp.	8/15-8/30		Regular
Ilg Electric Ventilating Co.	8/24-9/7	Open	Emergency, Stock only
La Crosse Cooler Co.	8/17-8/30	8/17-8/30	Stock only
Larkin Coils, Inc.	8/22-8/30		Stock only
Lehigh Mfg. Co., Div. of Lehigh Inc.	8/28-9/7	Skeleton	Stock only
Marlo Coil Co.	8/21-9/8	Open	Regular
McIntire Co.	8/24-9/7	Open	Emergency, Stock only
Morrison Products, Inc.	8/10-8/23	8/10-8/23	Emergency
Mueller Brass Co.	8/23-8/30	Open	None
J. F. Pritchard & Co. of Calif. Independence, Mo. plant	8/24-9/7		Stock only
Refrigeration Appliances, Inc.	8/22-9/8	8/22-9/8	Emergency
Remington Corp.	8/22-9/7		Regular
C. Schmidt Co.	8/23-9/7	Open	Stock only
Technical Filter Co.	8/10-8/22	8/10-8/22	Stock only
Temprite Products Corp.	8/16-8/30		Regular
Thermo King Corp.	8/17-8/30	Open	Stock only
Tubenfin Coil Co.	8/17-8/24	Open	Stock only
Typhoon Air Conditioning Co.	8/24-9/7		Stock only
Utility Fan Corp.	8/17-8/30	8/17-8/30	Stock only
Westinghouse Electric Corp. Air Conditioning Div.	8/10-8/31	8/10-8/23	Regular (Aug. 10-16, 24-31) Emergency (Aug. 17-23)
York Corp.	8/24-8/30	Open	Regular

Budlock Supply Announces New Catalog

EVANSVILLE, Ind. — Budlock Refrigeration Supply Co., Inc. announced release of its new spring and summer refrigeration and air conditioning catalog which has "over 300 pages of easy-to-read listings and descriptions, and thousands of informative illustrations."

Budlock said it provides same day shipment from all eight of its offices in the Midwest and South. The catalog may be obtained by writing "on your letterhead" to the company, 434 Carpenter St., Evansville, Ind.

FIELD SERVICE ENGINEER

Leading manufacturer of food store equipment requires a Field Service Engineer, age 30 to 40, to headquarter in or near Detroit, Jacksonville, Fla., Seattle, Wash., Boston, Mass., Kansas City, Mo., to travel in assigned territory contacting dealers, national accounts, and contractors. No sales involved.

Qualifications: 8 to 10 years commercial refrigeration experience, good personality, neat appearance, high school or better education, must have late model car. Will be given proper training on company products and field requirements. Salary, expenses, car mileage, life insurance and welfare plan furnished.

Reply in own handwriting, giving complete details of education, experience, and employment. No application considered unless accompanied with recent photograph. Give marital status and number of children.

Box A6303

Air Conditioning, Heating & Refrigeration News

American Potash Names Horn To Head Sales of Refrigerant Chemicals

LOS ANGELES—W. E. Horn has been appointed manager of refrigerant chemicals sales for American Potash & Chemical Corp., according to William M. Clines, western general sales manager.

W. E. Horn

Horn, formerly district sales manager for the company's agricultural chemicals section, will report to George Schnier, national sales manager for refrigerants and chemical fuels.

Research Products Announces Promotions

MADISON, Wis.—Promotions of personnel in various departments were announced by the management of Research Products Corp. at the conclusion of the firm's recently held annual sales executives' conference.

A. W. Brown, vice president for marketing, announced the appointment of John G. Schutz as general sales manager; and K. H. Lindquist as administrative assistant to Brown.

Harry Elwell, vice president for production, announced the appointment of A. H. Hambrecht as production manager and Jerry Staebell as Traffic manager.

E. B. Schlatter, Jr., vice president for purchasing, announced the appointment of Howard Hoveland as purchasing agent.

"Rapid expansion of all phases of the company's activities in its lines of air filters for residential, commercial, and industrial applications, "Aprilaire" automatic humidifiers, and other related products necessitated the appointments," according to the announcement.

All personnel bring long experience with the company to their new positions, it was noted.

Wagner Movie Details Motor Manufacturing

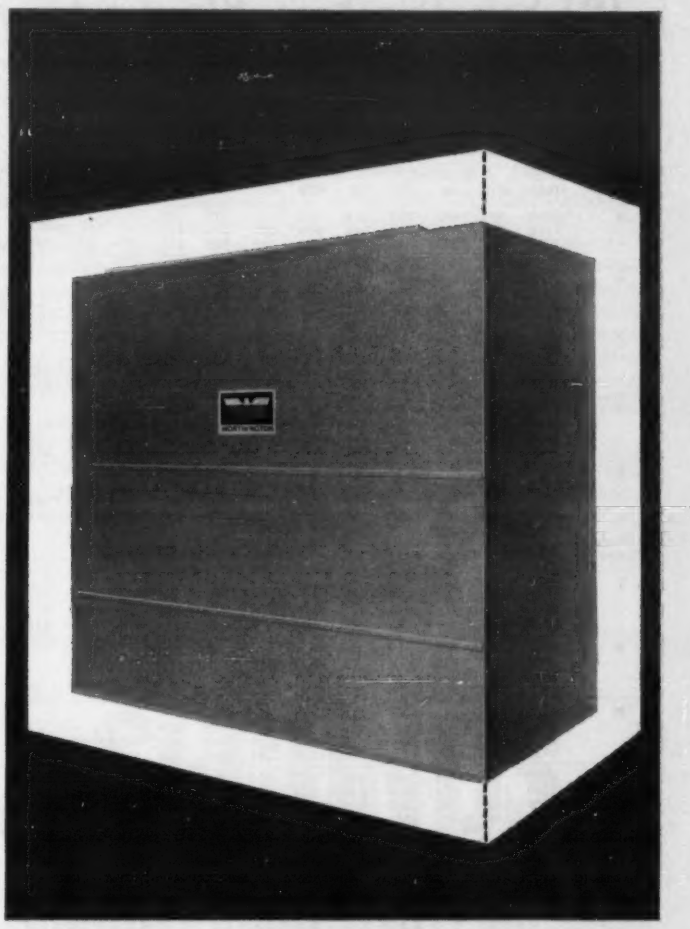
ST. LOUIS—"Motors in the Making," a 16-mm. sound color movie, has been released by Wagner Electric Corp.

The film shows, step-by-step, the processes in the manufacture of electric motors including frame fabrication, stator winding, rotor casting and winding, assembly, testing, and packing for shipment. Running time is 31 minutes.

The movie may be borrowed free of charge for showing to industrial, commercial, engineering, and educational groups through Wagner sales branches located in 21 principal cities. Further information may be obtained from L. C. Dobrunz, Sales Promotion Manager, Wagner Electric Corp., St. Louis 33.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

EXCITING THINGS ARE HAPPENING IN WORTHINGTON AIR CONDITIONING



25% SMALLER

than other package units

Worthington's line of packaged air conditioners now offers more sizes to choose from. In all, there are eight: 3, 5, 7½, 10, 15, 20, 25, and 30 tons, both air- and water-cooled.

Compare these Compact Dimensions

	HEIGHT	WIDTH	DEPTH
20 ton	72¾"	88¼"	34½"
25 ton	72¾"	88¼"	34½"
30 ton	75"	90½"	41¼"

Of course, you'll recognize immediately that these are the most compact dimensions on the market today for units in these tonnages.

The smaller size simplifies installation and provides more usable space for your customers. Take the 30 ton unit. This model is only 6 ft. 3 in. high. It will go through all doorways. (If you've ever had to dismantle a 30-ton unit to get it inside a customer's building or office, you know how rapidly this increases your installation costs).

FULL COIL CONTACT AT PARTIAL LOADS—These new Worthington package units are loaded with benefits for your customers, too. One feature, "full coil contact at partial loads," can mean a considerable saving in power costs. The coils of the new Worthington packaged units with more than one compressor are so arranged that there's always full passage of air over every set of coils. As a result, there is no by-passed unconditioned air at part loads.

A limited number of Worthington franchises are still available in certain territories. If you would like to discuss the possibility of handling the Worthington line, won't you drop us a note. Worthington Corporation, Section 12-29, Ampere Station, East Orange, New Jersey. In Canada: Worthington (Canada) Ltd., Brantford, Ont.

WORTHINGTON

Fundamentals of Air-Moving Systems

(2) Selecting Fans, Blowers for Top Performance

By L. C. Lindstrom, Air Impeller Div.
The Torrington Mfg. Co., Torrington, Conn.

Four-Bladed Series	Speed (rpm)	NAFM Code Test — Static Pressure (in. of water) — 0 cfm	0 hp	0.0625 cfm	0.0625 hp	0.100 cfm	0.100 hp	0.125 cfm	0.125 hp	0.200 cfm	0.200 hp	0.250 cfm	0.250 hp	0.300 cfm	0.300 hp	0.375 cfm	0.375 hp	NEMA Free-Air Test cfm	NEMA Free-Air Test hp
A	1050	620	.009	535	.013	455	.016	375	.018									905	.012
	1140	670	.012	595	.016	530	.018	475	.020									980	.015
	1500	880	.028	828	.032	790	.036	765	.037	650	.045	540	.052					1290	.035
	1725	1015	.042	970	.047	940	.051	920	.053	850	.060	775	.066	685	.074	600	.083	1485	.053
B	1050	720	.013	650	.017	570	.020	470	.021									1020	.018
	1140	780	.017	720	.021	650	.024	580	.025									1110	.024
	1500	1030	.039	990	.043	950	.048	920	.050	810	.058	670	.062					1460	.053
	1725	1185	.059	1145	.065	1120	.069	1100	.072	1030	.080	965	.087	880	.090	725	.101	1680	.081
C	1050	870	.022	775	.026	690	.028	575	.030									1240	.027
	1140	940	.028	860	.032	790	.035	730	.036									1350	.034
	1500	1240	.064	1180	.070	1140	.073	1110	.075	995	.082	820	.088	765	.093			1770	.078
	1725	1425	.097	1380	.104	1345	.108	1320	.110	1230	.118	1155	.123	1070	.128	890	.138	2040	.119
D	1050	755	.013	680	.017	605	.019	530	.022									1030	.014
	1140	815	.017	755	.0206	690	.023	640	.024									1115	.019
	1500	1075	.040	1035	.043	1000	.047	970	.050	860	.056	760	.064	695	.070			1470	.042
	1725	1235	.060	1205	.064	1180	.068	1155	.070	1075	.079	1010	.085	925	.092	820	.103	1690	.064
E	1050	955	.024	870	.027	795	.029	715	.031									1235	.026
	1140	1040	.030	955	.034	895	.036	845	.038	660	.045							1345	.033
	1500	1365	.069	1305	.074	1260	.077	1235	.078	1135	.085	1035	.092	935	.097			1770	.076
	1725	1570	.105	1520	.110	1485	.113	1460	.116	1385	.123	1325	.127	1250	.134	1110	.145	2030	.115
Three-Bladed Series																			
F	1050	870	.022	770	.027	695	.030											1030	.023
	1140	945	.028	855	.034	790	.037	730	.040									1315	.030
	1500	1250	.065	1180	.072	1135	.076	1100	.080	990	.087							1475	.067
	1725	1430	.100	1375	.106	1340	.110	1310	.114	1230	.120	1160	.128	1070	.135			1700	.103
G	1050	655	.007	590	.011													895	.007
	1140	710	.010	660	.013	585	.018											965	.010
	1500	940	.022	900	.026	875	.030	850	.033									1270	.022
	1725	1080	.034	1050	.037	1025	.042	1010	.045	935	.055	835	.060					1460	.034
H	1050	835	.012	750	.016	675	.020											1060	.013
	1140	895	.014	825	.020	770	.023	715	.026									1150	.017
	1500	1170	.033	1125	.040	1090	.045	1065	.047	970	.056							1515	.038
	1725	1350	.051	1310	.059	1280	.064	1265	.067	1195	.076	1165	.082	1050	.092			1740	.057
I	1050	995	.019	910	.025	855	.030	800	.032									1250	.020
	1140	1090	.023	1010	.032	950	.036	915	.038									1355	.025
	1500	1420	.053	1360	.062	1330	.064	1305	.070	1210	.082	1120	.092					1610	.056
	1725	1630	.082	1570	.094	1530	.100	1510	.105	1455	.116	1420	.122	1370	.132			1850	.085
J	1050	1150	.028	1070	.038	1000	.042	940	.058									1470	.035
	1140	1260	.038	1170	.047	1115	.052	1070	.054									1600	.044
	1500	1650	.087	1590	.100	1550	.105	1530	.110	1430	.120	1350	.126	1240	.130			2100	.100
	1725	1900	.132	1850	.150	1815	.160	1790	.164	1720	.174	1660	.180	1600	.186	1490	.190	2420	.152

FIGURE 7

* * *

Manufacturers' performance data may be given either in tabular form (Fig. 7) or in graphical form (Fig. 8). The table in Fig. 7 gives NAFM Code Test and NEMA free-air test data for five sizes (A, B, C, D, E) of four-bladed propeller fans of similar design and another series of five three-bladed propeller fans (F, G, H, I, J). Figures are given for various static pressures and operating speeds within the capacity range of these fans.

If the specifier is interested in speeds or pressures that are not listed, of course, he must estimate between the tabulated figures.

The graphical form of performance data in Fig. 8, which has been used frequently in this article series, is now being published by most leading impeller manufacturers because it actually furnishes more information about the impeller and, at the same time, is easier to use. Four or five sets of pressure and power curves for various speeds are normally given on one graph for a particular impeller size and design, such as blower wheel A in Fig. 8(a).

In addition to giving the diameter and width of the blower wheel itself and recommended maximum operating speed, major dimensions of standard housings for blower wheels are usually listed. These standard housing and orifice dimension (for propeller fans) are selected by impeller engineers to produce the best possible performance, as given in the performance data.

SELECTION EXAMPLE— PERFORMANCE TABLES

Selection of air impellers from performance tables is simply a matter of finding the particular impeller size, design, and model which most closely fits all the performance requirements. This procedure usually involves, first, rapid scanning of tables for a number of impellers which seem to be about right for the space available.

Assume, for example, that the following performance requirements are known in selecting a propeller fan for a small kitchen wall ventilator: $Q = 690$ c.f.m., $P_s = 0.10$ in. of water, and $N = 1{,}050$ r.p.m. A quick review of available impeller literature shows that the particular four-bladed series and three-bladed series of fans in Fig. 7 offer ranges of performance including the ventilator requirements.

At R.p.m. = 1,050 r.p.m. and $P_s = 0.10$ in. water, fan C in the four-bladed series provides $Q = 690$ c.f.m. and fan F in the three-bladed series delivers $Q = 695$ c.f.m. Impeller horsepower ratings given adjacent to the flow rates on the table are 0.023 and 0.030, respectively, for fan C and F. Each fan has a tip diameter of 12 in., while the axial depth of fan C is 3¼ in. and that of fan F is 3-31/32 in.

Since both these fans deliver very much nearly the required air flow rate and are similar in power and space occupied, it is wise for the specifier to consider the relative cost of fans C and F in the quantities desired as well as other structural factors which may contribute to intelligent selection between the two.

The impeller manufacturers' application specialists can be helpful in recommending the most suitable choice after reviewing in detail the air-moving system. In this case, for example, if the specifier had already decided to use three struts for motor support, it would be better to use the four-bladed fan C. More air noise is liable to be produced when a fan's blades rotate near an equal number of struts.

SELECTION EXAMPLE— PERFORMANCE CURVES

The fan laws and the concept of specific impeller speed can be applied in making quite accurate estimates of impeller performance from pressure and power curves. The best impeller can be pinned down much more rapidly and quite satisfactorily, however, by a little rough pencil sketching on the performance curves.

Assume that the following performance requirements are known in selecting a blower wheel for a large commercial oil burner: $Q = 230$ c.f.m., $P_s = 2.10$ in. of water; and $N = 3{,}450$ r.p.m. A blower wheel with forward-curved blades has been initially specified from experience in similar systems as the best impeller from the points of efficiency, size, and cost.

A cursory review of performance graphs show that the four blower wheels A, B, C, and D in Fig. 8 have pressure-flow curves within the range of interest and have outside housing dimensions (scroll width = a, height = b, and depth = c) that fit into the space allotted.

The first step is to pencil in the required operating point, $Q = 230$ and $P_s = 2.10$, on each of the four graphs. The blower wheel that most closely fulfills the specifications, of course, is the one (or more) in which the plotted operating point is nearest to the proper pressure curve in a range of relatively high static efficiency. None of the curves in Fig. 8, however, has been drawn for the specified operating speed of 3,450 r.p.m. Rather than apply the fan laws to draw an exact curve for 3,450 r.p.m., a rough curve can be drawn approximating that speed between the two curves for speeds just above and below 3,450 r.p.m. The same approach may also be taken in drawing rough curves for brake horsepower.

Although the entire rough curve has been drawn in for each impeller in Fig. 8 (dotted lines), only the portion of the pressure and power curves for 3,000 r.p.m. (#2) and 4,000 r.p.m. (#3). Since 3,450 is about halfway between 3,000 and 4,000, the rough curve is drawn about halfway between #2 and #3. Similarly, in Fig. 8(b) a curve for 3,450 r.p.m. is three quarters of the way from curve #4 for 3,000 r.p.m. and curve #5 for 3,600 r.p.m. The complete curve might then be drawn in as shown.

The same procedure has been followed for the pressure and power curves in Fig. 8(c) and 8(d). Although these curves

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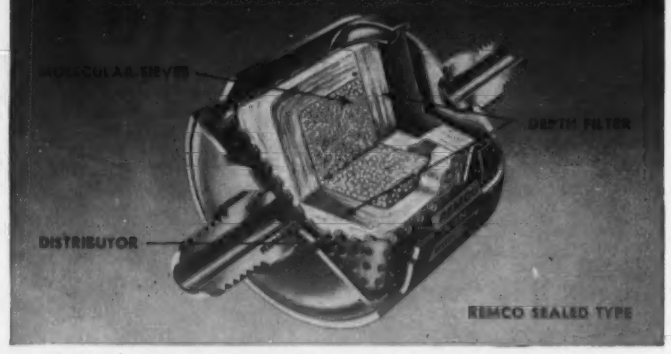

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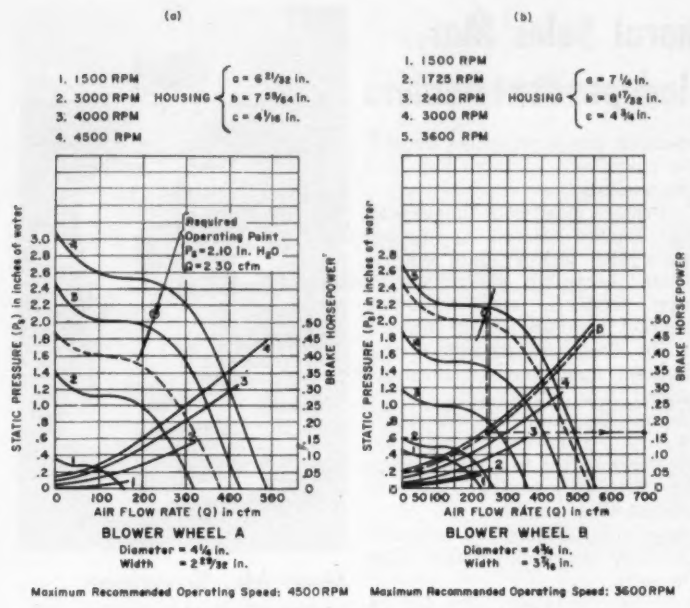

FIGURE 8

are by no means accurate in terms of fan laws, they are more than adequate in spotting the impellers which can deliver the desired air flow.

Evaluation of the four impellers is helped by drawing in a short section of an approximate system resistance curve (solid drawn line) through the given operating point and intersecting the rough pressure curve drawn. After having done this, it is evident in Fig. 8(a) that blower wheel A cannot deliver the required air flow at a static pressure anywhere near that existing in the oil burner system. Therefore, wheel A is eliminated from consideration.

The curves for blower wheels B, C, and D, on the other hand, are very close to the operating point in ranges of relatively high static efficiency. By drawing a line down from the operating point through the rough power curve and then horizontally over to the power scale, the respective brake horsepowers for blower wheels B, C, and D are .17, .19, and .17.

Again, this step is an approximation because the power should be determined for a flow right on the rough pressure curve rather than at the desired operating point.

Because each of the three blower wheels seems a likely choice, it is probable that relative cost will be a significant factor in the ultimate selection. In addition, while blower wheels B and D both have the lower horsepower requirements, wheel B might be preferred because it also occupies the least volume.

On the other hand, if width of the impeller housing were the limiting dimension, then blower wheel C might well be the final choice.

(The End)

ARE you in need of a "just right" man to fill a slot in your organization—the man you are looking for will be reading the

NEWS' CLASSIFIED ADS

C. A. Nolph Gets Newly-Created Carrier Post

SYRACUSE, N. Y. — C. A. Nolph has been named to a newly-created position of sales manager of military equipment in the Machinery & Systems Div. of Carrier Corp. here.

According to Hermann C. Hoffmann, general sales manager, "Carrier has become increasingly active in furnishing air conditioning and refrigeration equipment for all phases of missilery and nuclear-powered submarines. This internal reorganization will enable us to better serve these and other programs of a military nature."

Nolph was formerly sales manager of the Syracuse district, taking that post in 1952 after seven years as sales engineer in the Rochester, N. Y. office of Carrier.

John C. Hicks, former senior engineer for large air conditioning systems, will be assistant sales manager. Manager of engineering for the new group will be William Masin, who previously held the same position for the company's Marine Dept. in New York City.

White-Rodgers Describes 'Silent Knight' Valves

ST. LOUIS—A six-page folder describing the entire line of "Silent Knight" gas valves has been released by White-Rodgers Co. here.

Copies can be obtained from White-Rodgers sales branches or by requesting form R-1635 from White-Rodgers So., 1209 Cass Ave., St. Louis 6, Mo., or 611 Gerrard St. E., Toronto 8, Ont., Can.

Frigidaire Revises Home Study Course On Electricity

DAYTON — A newly-revised home study course on "Practical Electricity" is the latest addition to a series of study courses offered to Frigidaire servicemen as a regular part of their literature subscription, according to the company.

Like previous sections on "Fundamentals of Refrigeration" and "Cooling Coils and Condensing Units," the electrical course serves additionally as a major part of the serviceman's reference library, according to E. E. Landis, Frigidaire service manager.

The home study course includes tests and reviews which are completed by the servicemen and graded by the company.

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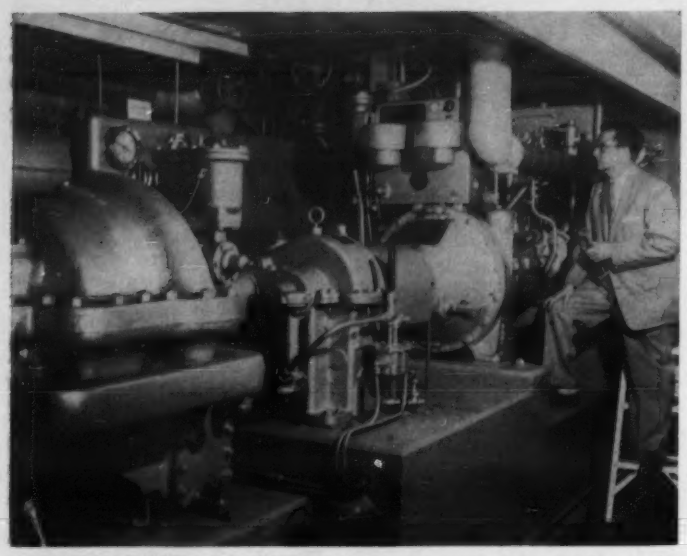

A NEW GAS-DRIVEN water chilling machine has been placed in operation at the headquarters of Milwaukee Gas Light Co. in Milwaukee. Checking performance of the Waukesha engine powering a Carrier centrifugal refrigerating machine is Earl A. Tetting, building management superintendent. Cost of operation is comparable to other energy sources, it is claimed.

To Dramatize Gas as Energy Source

Gas-Powered Water Chiller Cools Milwaukee Utility Display Area

MILWAUKEE — A water chilling machine powered by natural gas has gone into operation to air condition the display areas of Milwaukee Gas Light Co.'s main office building.

Replacing the customary electric motor or steam turbine power source, this centrifugal cooling unit is driven by a piston engine using natural gas as the fuel.

"It is one of the first installations of its type in the nation," according to Bruce A. McCandless, vice president of sales, for the Gas Co.

Installed to dramatize gas as an energy source, it operates at a cost which compares favorably with other types of systems. McCandless pointed out that at 6 cents a therm—the company's rate for gas used for cooling—the Waukesha engine's operating cost is equal to what would be charged if electricity could be purchased at less than one cent per kwh.

The system makes use of a standard Carrier centrifugal compressor, condenser, and cooler.

Housing Conference Set for Sept. 15 In Washington, D. C.

WASHINGTON, D. C. — National Association of Home Builders will stage a National Family Conference on Housing Sept. 15-17 at the National Housing Center here.

In past years, local associations affiliated with NAHB have sent housewives as delegates to the conference. This year, the 45 local groups have been asked to send husband and wife teams.

In some areas, local groups will hold their own family conferences, with delegates to the national forum selected on the basis of a contest.

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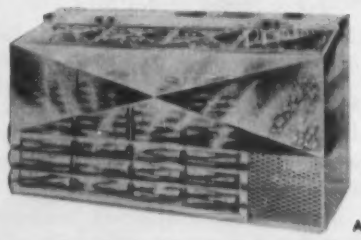

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RCA-Whirlpool's General Sales Mgr. Sees Need for Strong Independent Dealers

SALT LAKE CITY — Wide fluctuations in volume and profit during recent years have given appliance manufacturers a new appreciation of the need for a stronger system of independent dealers, Lincoln M. Larkin, general manager of "RCA Whirlpool" air conditioning sales for Whirlpool Corp., told members of the Intermountain Electric Association.

In a speech on trends in the appliance industry, Larkin declared that despite the importance of other channels of distribution, such as department stores, builders, and metropolitan chains, "the thoughtful and far-sighted manufacturer is carefully studying the problem of developing a stronger system of independent dealers."

He said that a 30% decline in the number of dealers between 1949 and 1955 emphasizes the manufacturer's responsibility to "develop the skills to work with the dealer in building a retail program that will enable him to compete successfully on a profitable basis.

"Finance companies and instalment credit bankers who have an appreciation of the dealers' needs will also be able to contribute valuable help and counselling."

Dealers must help themselves, too, Larkin advised, by keeping pace with new product innovations, becoming specialists on new products, and improving market position and profit.

He cited the growth in the built-in appliance business and called it an opportunity for the dealer to multiply his dollar volume. However, he said, the dealer has not taken advantage of the opportunity and estimated that less than 5% of independent dealers are active in kitchen remodelling and built-in sales.

A second opportunity for the independent dealer, Larkin said, lies in the area of growing replacement sales. As an example, he said, only 2% of air conditioner sales in 1954, was replacement volume. Today the figure is 11.6%, Larkin said. He added: "The dealer who understands his product, carries a full model assortment, and gives attention to the fundamentals of good retail merchandising, will compete more effectively than the dealer who has not kept pace."

American-Standard Announces 'Package' Direct Mail Program for Home Cooling

NEW YORK CITY — American-Standard Air Conditioning Div. has announced a "package" direct mail program to develop high quality leads for central residential air conditioning sales.

"Under this program," the announcement said, "the dealer can put a powerful three-part campaign into the mail for a cost of less than 4½ cents per name per mailing. This cost includes a set of three mailing pieces, imprinting the dealer's name in two places, addressing, mailing, and postage.

"This price also includes the mailing list which is custom tailored by actual homeowner name and address to cover the area designated by the dealer."

According to W. H. Baker, vice president marketing of the division, "This is a package direct mail program where everything is done for the dealer. The series of these mailings are attractive and highly informative.

"They fully describe the benefits and advantages of central air conditioning and the ease with which it can be installed; and we know from research figures that a series of three mailing pieces will outpull a single mailing by 5-to-1."

Under the program, mailings are sent out ten days apart. Each mailing piece is imprinted with the dealer's name and contains a business reply card which is also imprinted with the dealer's name and address.

The dealer has three choices of how his mailings will be processed.

Under the first plan, he indicates by area where his best air conditioning prospects live. A list of homeowners by name and address "not occupant" will be compiled, his mailing imprinted, addressed, and mailed automatically for him.

Under the second plan, the dealer submits his own prospect list, and the mailings are imprinted, addressed, and mailed for him to his list.

Under the third plan, the mailing pieces are imprinted and supplied to the dealer so that he may make his own mailings.

N. Y. City College Plans Evening Air Conditioning Course

NEW YORK CITY—An evening course on the principles and practices of air conditioning will be conducted this fall at the City College of New York.

The course will be held on Tuesday and Thursday evenings from 6:35 to 8:50 p.m. starting Sept. 22, according to G. Donald Brandt, supervisor. It will run to Jan. 12.

Tuition for the technical, college level course is $58.50 plus a $5 general fee. Advance registration can be made by mail until Sept. 18.

Address is City College School of General Studies, Evening Division, Uptown Center, Convent Ave. at 139th St., New York 31, N. Y.

Course will cover atmospheric changes, methods of humidification and dehumidification, determination of relative humidity and heat content, use of psychrometric chart, heat transfer through walls, types of equipment, trouble shooting, and design of an installation.

Meet Mr. Snowman . . . the room air conditioner industry's "cool" award for red-hot promotional performance in 1959. Designed by John Russell Ridge, this attractive 10-in. statuette will be presented soon to the manufacturer who, industry judges report, conducted this year's most effective "Beat the Heat" campaign. The award, to be made by the Room Air-Conditioner Section of the National Electrical Manufacturers Association, is one in a series of continuing highlights marking 1959's all-industry promotion which is keyed to this slogan: "Beat the heat with an air conditioner."

Coolerator Announces Expansion of Production, Shipping Facilities

ALBION, Mich.—M. F. Beisber, president of Coolerator Div., McGraw-Edison Co., announced that work has started on equipment installation and new shipping facilities here.

Metal fabrication capacity will be substantially expanded as heavy press and welding equipment recently purchased from the O. A. Sutton Corp. is installed.

Shipping facilities will be more than doubled with the installation of a new finished goods conveyor handling system and a new loading dock.

Kelvinator June Sales Of Room Units Up 80%

DETROIT — Kelvinator room air conditioner sales in June were up 80% over last year, marking the second consecutive month with sales at record peaks, Homer L. Travis, vice president in charge of sales, Kelvinator Div., American Motors Corp., announced.

Refrigerator sales were up nearly 43% in June and up nearly 36% for the first six months as compared with last year.

May Distributor Sales 12% Higher Than Last Yr.

WASHINGTON, D. C. — May sales of distributors of air conditioning and commercial refrigeration equipment were 12% above a year ago and 10% above April, the U. S. Bureau of the Census reports.

Their sales for the five months were 8% over the same period in 1958.

Their inventories at the end of May were 10% greater than a year ago.

Home Cooling--

(Concluded from Page 1, Col. 2)

nace and operates off the same thermostat. He did not state how large his house is or give any other data on its construction or location.

He said the installation cost $1,415 including a cooling tower which cost about $465 installed.

With recirculated water, electricity was about his only operating cost, Woerpel said. He commented: "Our electric bills actually are lower in summer than in winter. For example, the bill for last December and January was $28.77. For August and September it was $27.44.

"So it seems that the reduced use of electricity for lighting, television, and the like in summer more than balances out the cost of the air conditioning."

Woerpel said that his family usually sets the thermostat at about 80° F.

"That is very comfortable because the air conditioner has removed most of the moisture from the air," he asserted. "This is particularly true when the family is dressed in cool informal clothing.

"When expecting dress up company, however, we turn the thermostat down to 72 or so. Then it is comfortable with ties and coats."

Woerpel declared that the "secret" in keeping the house cool with only a 2-ton unit was in setting the thermostat for a certain temperature and keeping it there, thus avoiding letting the house get really hot.

The side benefits that people boast about are really true, for the most part, he advised.

"We have better appetities, eat hot meals.

"It used to be hard for the children to get to sleep in the early evening before temperatures dropped. Now they can sleep with a quilt over them.

"We've found too that air conditioning helps prevent summertime colds. On a hot night we used to sleep with all windows open and no blankets. Then when the night air turned chilly we'd catch cold. Now the windows are kept closed.

"We would never have bought central air conditioning," he affirmed, "if it hadn't been for a hay-fever problem in our family. But now that we have it, we think it's great."

R. F. Lauer Joins--

(Concluded from Page 1, Col. 5)

signments in the East.

His progress included Manager of the Washington national offices, during the period of World War II and thence to the Pacific Coast as zone manager for that area. In 1950 he became vice president and director of engineering. During this latter period he guided many new product developments from the smallest room air conditioner to the largest centrifugal water cooling system.

Firm Moves

SHREVEPORT, La. — Ballard's Air Conditioning, Inc. here has filed a charter amendment with the Secretary of State at Baton Rouge, changing the domicile of the firm to 1003 Hudson Lane, Monroe, La.

Noland Elects Officers, Plans For Expansion

NEWPORT NEWS, Va. — A new plan of management organization, election of new officers, and appointment of branch managers was announced by the Noland Co., Inc. following a three-day management conference in Richmond.

Noland

Sommers

Lloyd U. Noland, Jr., who was raised from president to chairman of the board of the refrigeration, air conditioning, plumbing, heating, and electrical wholesaling firm, said that the new organization decentralizes responsibility to younger people in management to broaden its base for anticipated expansion in the 1960's.

Noland Co. has 36 branches throughout the south.

Noland said that major emphasis continues to be on management by function, but the help to be furnished branch managers has been spelled out and added responsibilities have been given branch managers.

Responsibilities Set

Under the new organization, Noland will have major responsibility for long range planning for orderly company growth.

John E. Sommers, executive vice president since 1954, becomes president and chief operating officer of the company.

M. Gardner Smith was elected vice president-marketing; Rudolph F. Ourednik, vice president-personnel; William M. Long, vice president-purchases; and Allen N. Unger, vice president-finance.

Sterling Q. Groover was appointed manager of inventories and facilities; Gordon T. Pearson, manager of merchandising—plumbing and heating; C. V. Hale, manager of merchandising-refrigeration (including air conditioning); C. P. Andrew, manager of merchandising-electrical; and Howard F. G. Hinson, Jr., manager of merchandising-industrial and machine tools.

B. H. McGehee has been appointed treasurer; and John Clark, Jr., general manager of the Noland Credit Co., now part of the marketing division.

Effective July 30, H. F. Brooks becomes branch manager at Gadsden, Ala. and M. F. Strickler, branch manager at Charlottesville, Va.

Effective Aug. 10, T. J. Bately will manage the Memphis, Tenn. branch and B. Cates, Jr. the Hagerstown, Md. branch.

Effective Aug. 24, J. L. Kerr becomes branch manager at Nashville, Tenn. and J. P. Murphy branch manager at Roanoke, Va.

C. W. Whaley will head the Washington, D. C. branch effective Sept. 14.

Inland Empire Model Code Ready for Local Adoption

(Concluded from Page 1, Col. 3)

nance of these types of equipment.

The association anticipates that it will eventually handle research and product approval for equipment in these fields.

According to Spradley, the research and product approval function will work this way:

The association will appoint a committee to evaluate the testing of a product done by a nationally recognized testing laboratory.

"If, after checking the tests given a product and finding them satisfactory," he said, "the association will then grant approval and so notify the cities and counties who have adopted this code."

However, he pointed out, it will still be up to the local administrative authority to accept the product.

May Establish Own Testing Laboratory

"At some future date, it is highly possible that the association may establish its own testing laboratory," Spradley declared.

A brochure issued by the association states: "A research committee reviews and tests products of merit for which no standards exist. Products must meet Inland Empire Code Association standards for test and acceptance, and upon their approval, are listed for members and users of the Inland Empire Code Association code.

"This voluntary and informative service assists local governmental agencies in administration of code provisions wherein products are specifically required to be approved in their installation and use.

"Nationally recognized standards, where they exist and are applicable, are a part of the Inland Empire code."

184-Page Code Divided Into 16 Divisions

The 184-page code is divided into 16 divisions. Divisions cover administration, definitions, comfort heating equipment, blower and exhaust systems, comfort cooling and heat pumps, evaporative coolers, boilers and industrial furnaces, chimneys or flues, incinerators, restaurant type cooking appliances, miscellaneous heating and cooking appliances (such as room heaters, ranges, hot plates, and clothes dryers), water heaters and vents, refrigeration and water conservation, refrigerating equipment, storage of refrigerants, cooling towers, and water conservation.

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Inspections will be required for all work except repair, maintenance, and adjustments that cost less than $20 for materials and labor, and except for portable air conditioning equipment.

While the refrigeration sections of the safety code do not refer directly to the ASA B9.1 refrigeration code, a number of provisions have been taken directly from it.

According to Spradley, the initial financing for this code, drafting of the work copies, and compiling of information was supplied by the Inland Air Conditioning and Refrigeration Contractors Association, Inc.

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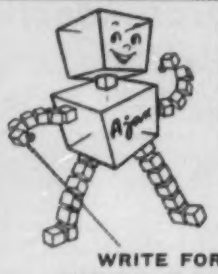

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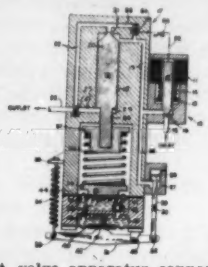
PATENTS

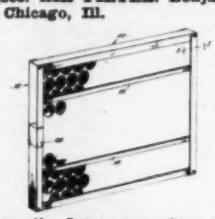
Week of Mar. 17 (Concluded)

2,877,796. COMBINATION PRESSURE REGULATOR AND SHUT-OFF VALVE. Joseph T. Abdo, Los Angeles, Calif.



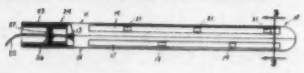
9. A valve apparatus connected to a high pressure inlet line for controlling pressure at an outlet line, comprising: valve means; means responsive to pressure at the inlet line tending to open said valve means; means responsive to pressure at the outlet line tending to close said valve means; and, timing means acting to vary said force means over a given period of time.

2,877,863. AIR FILTER. Benjamin L. Lurie, Chicago, Ill.



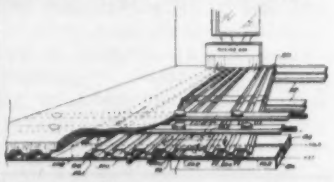
A generally flat rectangular air filter comprising a generally rectilinear mass of fibrous material of appreciable width in two directions and of relatively small thickness, a pair of spaced parallel perforated grille plates on opposite main faces of said mass and, in combination with said mass, defining a sandwich-like construction, a rectangular one-piece frame encompassing said sandwich-like construction and extending consecutively along four minor faces of said mass, said frame being channel shape in transverse cross section and having an unbroken web portion folded around three minor faces of the mass in close proximity thereto and folded around the fourth minor face of the mass in overlapping relationship in the medial region of said latter face. . . .

2,878,355. ELECTRICAL TEMPERATURE SENSING ELEMENT. Lyell J. McDonald, Elkhart, Ind., assignor to Penn Controls, Inc., Goshen, Ind.



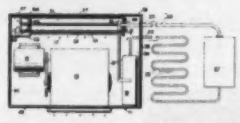
1. A temperature sensing element comprising a tubular casing of electrically conductive high thermal conductivity material, said casing being circular in cross section and having one closed end, four axially extending flats formed in circumferentially spaced relation on said casing, a bank of spaced electrical resistances mounted on the interior surface of each of said flats with one terminal of each of said resistances electrically connected to said casing, lead wires electrically connected to the other terminals of said resistances and extending exteriorly of said casing through its open end, said resistances being positioned in staggered relation along said casing, and means disposed within the open end of said casing accommodating said leads for hermetically sealing the casing interior.

2,877,990. AIR CONDITIONING AND ELECTRICAL WIRE DISTRIBUTING STRUCTURE. Richard P. Goemann, Port Washington, N. Y., assignor to H. H. Robertson Co., Pittsburgh, Pa., a corporation of Pennsylvania. Original application Feb. 24, 1954, Serial No. 413,217, now Patent No. 2,729,429, dated Jan. 3, 1956. Divided and this application Dec. 9, 1955, Serial No. 552,016.



In a building and air conditioning system, a cellular load supporting floor providing a series of metal wire-carrying cells and a series of metal air-carrying cells disposed in a common horizontal plane and including separate hot and cold air-carrying cells; air discharge outlets communicating with said air-carrying cells; means for supplying air to the air-carrying cells, including metal hot and cold air-carrying supply ducts having surfaces disposed in juxtaposed relation below the surface of and extending transversely of said air-carrying and wire-carrying cells and communicating with said hot and cold air-carrying cells, respectively. . . .

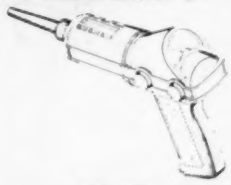
2,877,991. HEAT EXCHANGERS. William A. Warrington, Jr., Cordova, Tenn.



1. Heat exchanger means adapted for use in a cooling system which includes means for circulating a fluid refrigerant to and from said heat exchanger means, a housing open at one end for air flow into said housing and having an air flow discharge from said housing, wall means cutting off air flow at one side of said open end, and air flow impeller means disposed to establish air flow through said open end and out. . . .

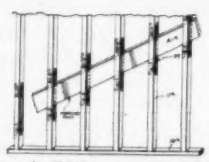
DESIGNS

184,639. LEAK DETECTOR. John A. Roberts, Lynnfield Center, Mass., assignor to General Electric Co.



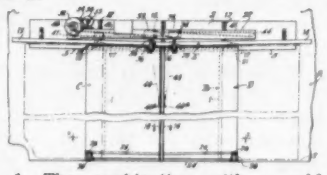
Week of Mar. 24

2,878,529. AIR DUCT MOUNTING DEVICE. Raymond R. Dupler, Toledo, Ohio.



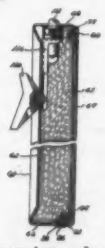
1. In a building structure having a row of studs, each stud being elongate rectangular in cross section, with the narrow portion outermost, a horizontal ceiling plate, a portion of each stud being severed directly below said ceiling plate to provide a way for an air duct of oblong cross section, the improvement which comprises a rigid two-part bracket for each stud. . . .

2,878,532. SLIDING AND SEALING DOOR FOR COLD STORAGE AND THE LIKE. Henry B. Clark, Elizabeth, N. J.



1. The combination with a cold-storage room wall in which there is a rectangular door opening having top, bottom and side margins in approximately a common plane, of a door, mounting means providing for one continuous composite movement of the door relatively to said wall edgewise parallel to said plane and laterally parallel to said door opening, sealing means for the top margin of said door opening brought into sealing condition by said lateral movement of the door toward said wall, and sealing means for the side margins of the door opening brought into door sealing condition by said edgewise movement of the door.

2,878,534. REFRIGERATING APPARATUS. John J. Josatis, Detroit, Mich., assignor to American Motors Corp., Detroit.



1. A rectangular door structure adapted as a closure between zones having an appreciable temperature differential, said structure comprising inner and outer panels forming a space therebetween, insulating material disposed in and substantially filling the space between said panels, said panels formed of dissimilar material having different characteristics for expansion and/or contraction upon changes in environmental temperature, said outer panel flanged about its periphery to extend toward said inner panel and forming sides thereof. . . .

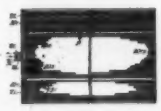
Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

Printed copies of patents, reissued patents, and patent designs may be secured from the Patent Office; patents and reissues are 25¢ each, while designs are furnished at 10¢ each. Address orders to: Commissioner of Patents, Washington 25, D. C.

2,878,535. SEALING STRIP. Russell J. Bush, Dayton, Ohio, assignor to General Motors Corp., Detroit, Mich.

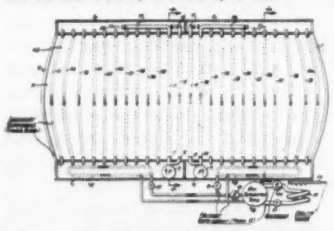
1. An elastomeric sealing strip for joining a pair of building construction panels both having a width of relatively thick cross section, comprising, a pair of relatively thick and generally parallel portions including wings of substantial thickness terminating in lips, a relatively thinner central member connecting said parallel portions in a generally H-shaped cross section providing two channels having a width substantially that of the thick cross section of the building panels on each of opposite sides of said central member. . . .

2,878,651. ICE RINK CONSTRUCTION. John A. Heinzelman, Chicago, Ill.



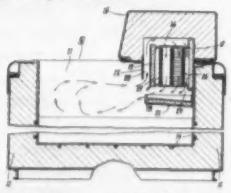
7. In an ice rink construction, the combination of a refrigerant supply line entering one end of the rink and extending along one side thereof to an intermediate point and then extending transversely across the rink to the opposite side thereof, right and left supply headers at said opposite side of the rink branching outwardly from said supply line. . . .

2,878,652. ICE-SKATING RINK. David M. Comb, Belmont, Calif.



1. An ice-skating rink comprising a floor, a plurality of tubes adjacent to said floor, two troughs each adapted to contain a liquid, each of said tubes having two ends extending into respective ones of said troughs from above the liquid level down into the liquid and forming a siphon for transferring liquid from one trough to the other, means for pumping said liquid from one to the other of said troughs, and means for cooling said liquid.

2,878,653. REFRIGERATED DISPLAY CASE. Charles E. Rembold, Dayton, Ohio, assignor to General Motors Corp., Detroit.



In combination, a display case of a predetermined length having an open top food storage compartment therein and a chamber separate from said compartment but communicating therewith, a refrigerating system associated with said case including an evaporator within said chamber, said evaporator comprising rectangular sheets of metal bonded together to form, without the aid of additional means, a unitary one-piece structure having refrigerant expansion passages therein and being substantially longer than said predetermined length of the display case. . . .

(To Be Continued)

Servicing Automobile Air Conditioners

(Vol. 4 — 1959 Models)

BY C. DALE MERICLE

With this issue we continue the fourth series of articles describing service procedures on automobile air conditioning units. In these instalments 1959 models of the leading "independents" and automobile manufacturers are being described in detail.

As with the previous series, these articles are intended for the refrigeration serviceman who has a good grounding in fundamentals backed with practical experience.

Previous articles covering earlier models of many makes of units are available from the NEWS in manual form as Vols. 1, 2, and 3 of "Servicing Automobile Air Conditioners." Vol. 3 being devoted to 1958 models.

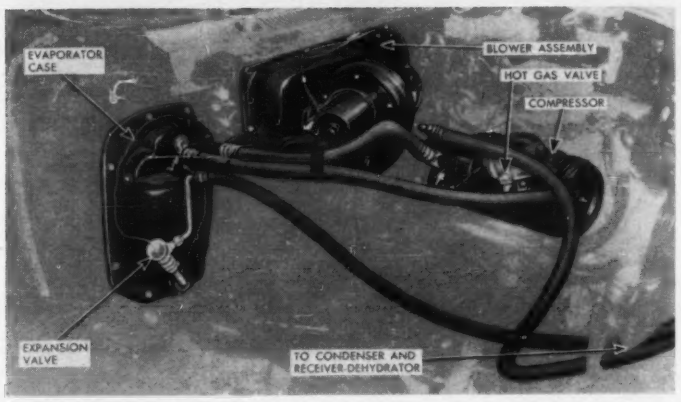


FIG. 1—Location of major components in 1959 Chevrolet All Weather system.

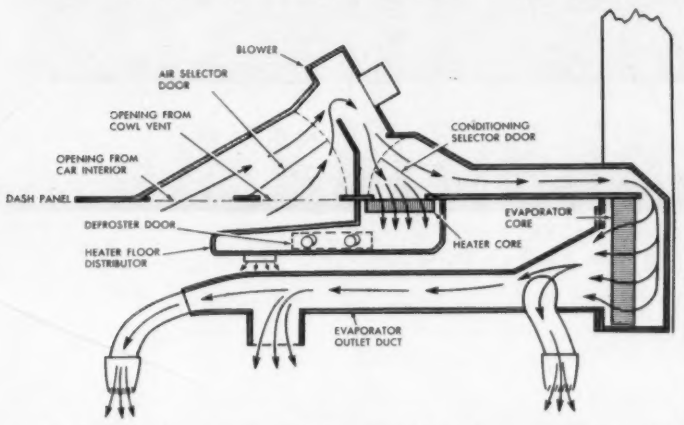


FIG. 2—Schematic of air flow in 1959 Chevrolet All Weather system. In actual operation "door" above heater core should be fully closed for cooling, fully open for heating.

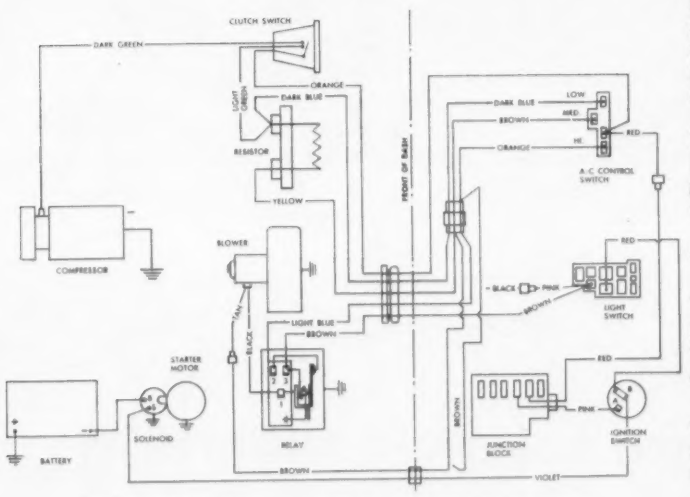


FIG. 3—Wiring diagram of 1959 Chevrolet All Weather system.

CHEVROLET (1)

Chevrolet Motor Div.
General Motors Corp.
Detroit 2, Mich.

The 1959 Chevrolet air conditioning line includes two systems: the "All Weather" unit, which has the evaporator mounted in the engine compartment on the cowl, and the "Cool Pack" system, which has the evaporator assembly suspended from the dash like the conventional hang-on unit.

There are no significant changes in the basic refrigeration system of the 1959 All Weather system. Thus the detailed service information given in Vol. 3 about the 1958 unit will apply to the 1959 system.

A drastic change has been made in the 1959 Cool Pack system, however. Although the outward appearance of the evaporator case is about the same, the 1959 Cool Pack achieves temperature control by means of a thermostat cycling the magnetic clutch and compressor. The 1958 Cool Pack used a manually adjustable hot gas by-pass valve for temperature control.

Both 1959 Chevrolet systems have the same condenser and compressor. Condenser is mounted in front of the car radiator. Beside the condenser is mounted the combination receiver-dehydrator and sight glass. Compressor is the Frigidaire 5-cylinder axial model and is driven through a magnetic clutch.

Refrigerant-12 is employed in both 1959 systems. Full charge is 4½ lbs. in the All Weather system; 4 lbs. in the Cool Pack under-dash unit.

All Weather System

Evaporator of the 1959 All Weather system (Fig. 1) is in an insulated case mounted on the right side of the cowl in the engine compartment.

Thermostatic expansion valve, which is non-adjustable, is located on the outside of the evaporator case.

Blower assembly is also mounted on the cowl in the engine compartment. Blower is used for both heating and cooling.

Conditioned air is delivered to the car interior through three adjustable outlets on the dash.

Manual control of air dampers (Fig. 2) permits selection of 100% outside air, 100% recirculated air, or a mixture of the two. Unlike the 1958 system, however, the 1959 damper arrangement requires that air flow either through the evaporator or through the heater core, so no reheat cycle is possible with the 1959 system.

Controls for turning the system on or off, selecting blower speed, damper arrangement, and setting of hot gas by-pass valve for temperature control are located on the car instrument panel. By-pass valve is mounted on the compressor. (It was at the evaporator on 1958 All Weather system.)

Wiring diagram of the 1959 All Weather system is shown in Fig. 3.

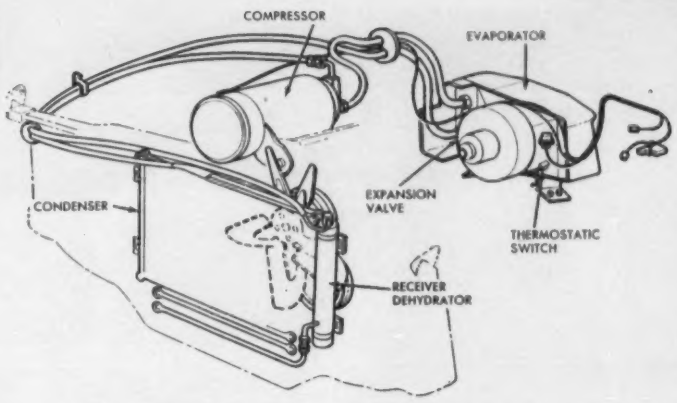


FIG. 4—Location of major components in 1959 Chevrolet Cool Pack system.

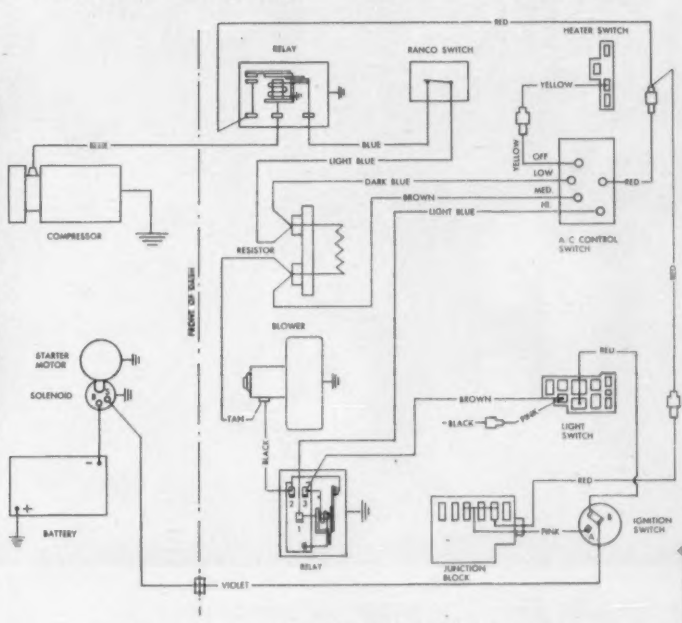


FIG. 5—Wiring diagram of 1959 Chevrolet Cool Pack system.

Cool Pack System

Evaporator assembly of the 1959 Cool Pack model (Fig. 4), which is suspended beneath the dash, includes the evaporator coil, thermostatic expansion valve (non-adjustable), blower, four adjustable air outlets, thermostat for cycling magnetic clutch and compressor, and controls.

Outward appearance of the 1959 Cool Pack case is about the same as the 1958 model.

There are two sliding levers on the front of the case at the top. One lever controls blower operation. Other lever adjusts setting of thermostat controlling clutch.

Thermostat is adjustable. It should be set so that the system cuts out when the suction pressure drops to 18 p.s.i.g. Turning the adjusting screw counterclockwise lowers the cut-out point of the thermostat; turning it clockwise raises the cut-out point.

The Cool Pack system operates on 100% recirculated air.

Wiring diagram of the 1959 Cool Pack unit is shown in Fig. 5.

(To Be Continued)

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52—SF660 8" 12 volt Warner Clutch
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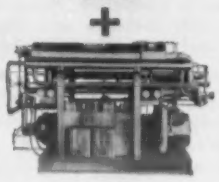

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